



US 20240130591A1

(19) **United States**

(12) **Patent Application Publication**
JANG et al.

(10) **Pub. No.: US 2024/0130591 A1**

(43) **Pub. Date: Apr. 25, 2024**

(54) **CLEANER**

Publication Classification

(71) Applicant: **LG Electronics Inc.**, Seoul (KR)

(51) **Int. Cl.**

A47L 11/40 (2006.01)

A47L 9/28 (2006.01)

A47L 9/32 (2006.01)

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(52) **U.S. Cl.**

CPC *A47L 11/4005* (2013.01); *A47L 9/2878*

(2013.01); *A47L 9/2884* (2013.01); *A47L*

9/325 (2013.01); *A47L 11/4038* (2013.01);

A47L 11/4069 (2013.01); *A47L 11/4075*

(2013.01); *A47L 11/4083* (2013.01); *A47L*

11/4086 (2013.01); *A47L 11/4088* (2013.01)

(21) Appl. No.: **18/279,033**

(22) PCT Filed: **Feb. 25, 2022**

(86) PCT No.: **PCT/KR2022/002794**

§ 371 (c)(1),

(2) Date: **Aug. 24, 2023**

(57)

ABSTRACT

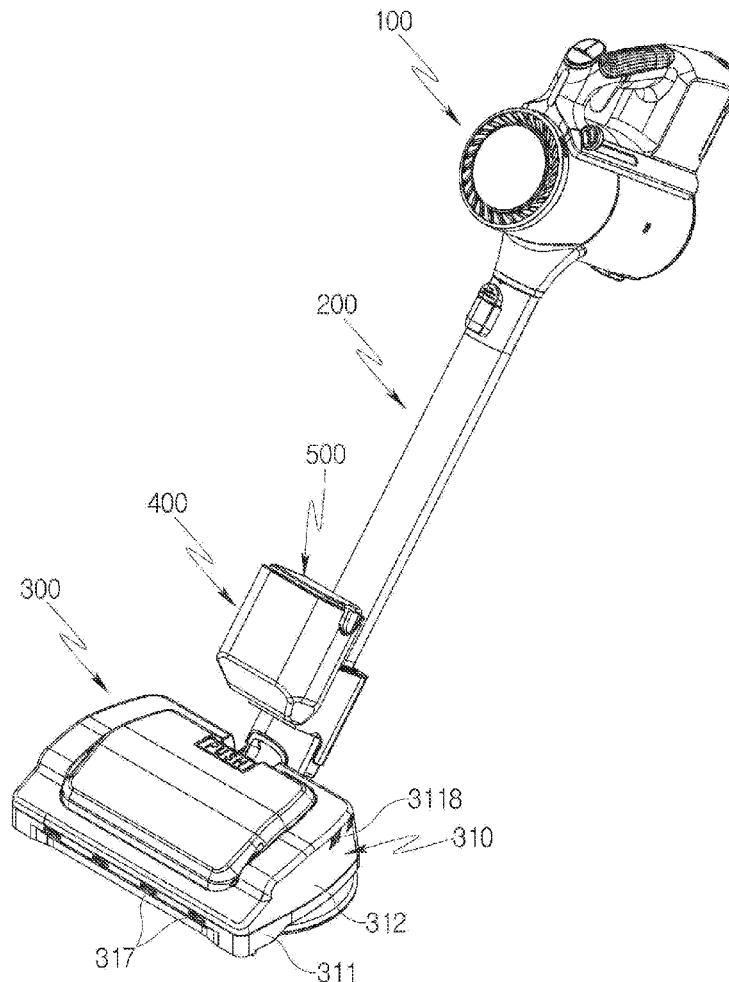
The present disclosure relates to a cleaner including a cleaner main body including a battery and a handle configured to be grasped by a user, a cleaning module detachably coupled to the cleaner main body and configured to eliminate debris on a floor surface, an auxiliary battery housing detachably coupled to the cleaning module, and an auxiliary battery detachably coupled to the auxiliary battery housing and configured to supply power to the cleaner main body or the cleaning module, thereby allowing a user to easily manipulate the cleaner while supplying additional power from the auxiliary battery.

Related U.S. Application Data

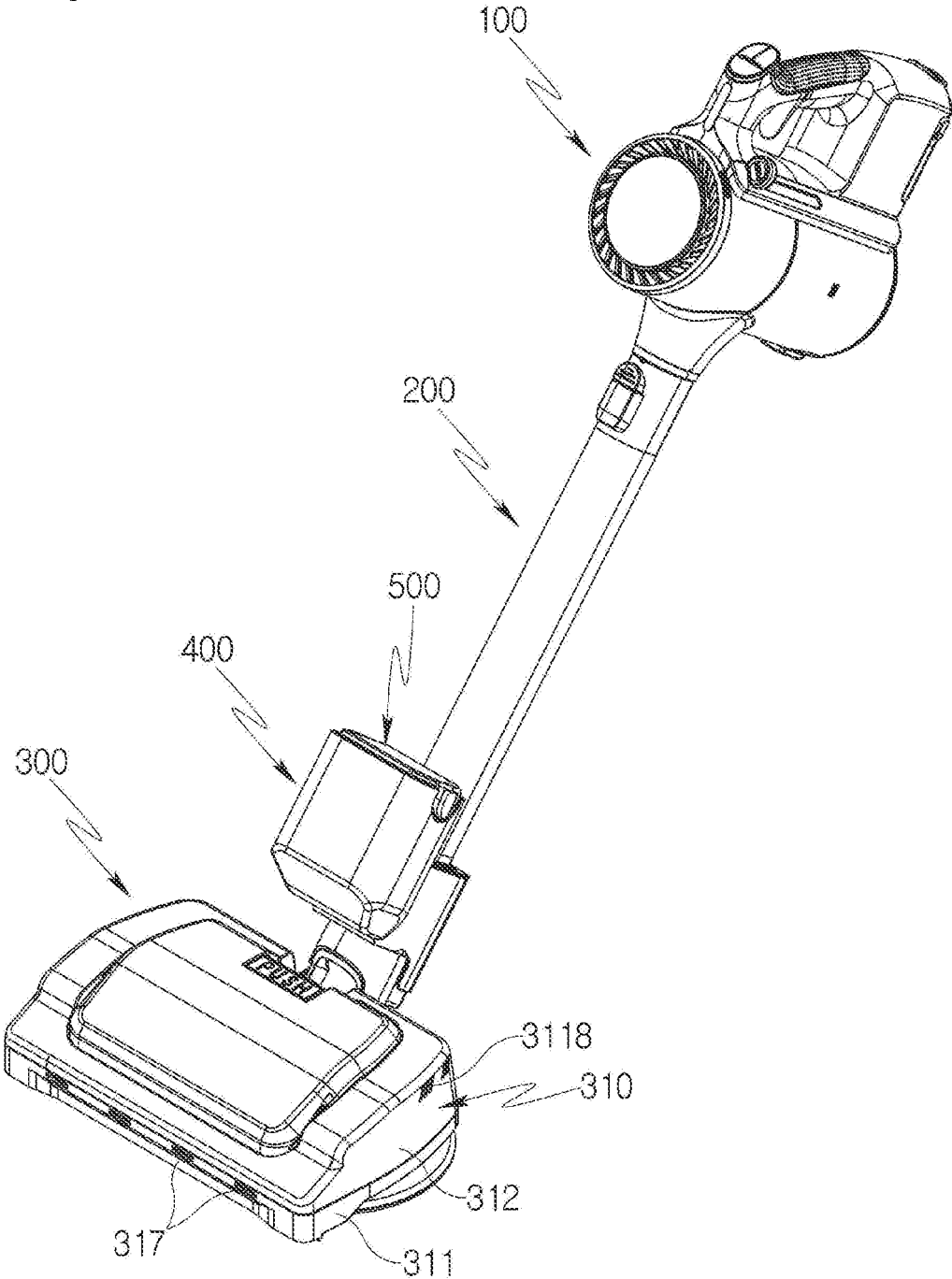
(60) Provisional application No. 63/154,269, filed on Feb. 26, 2021.

Foreign Application Priority Data

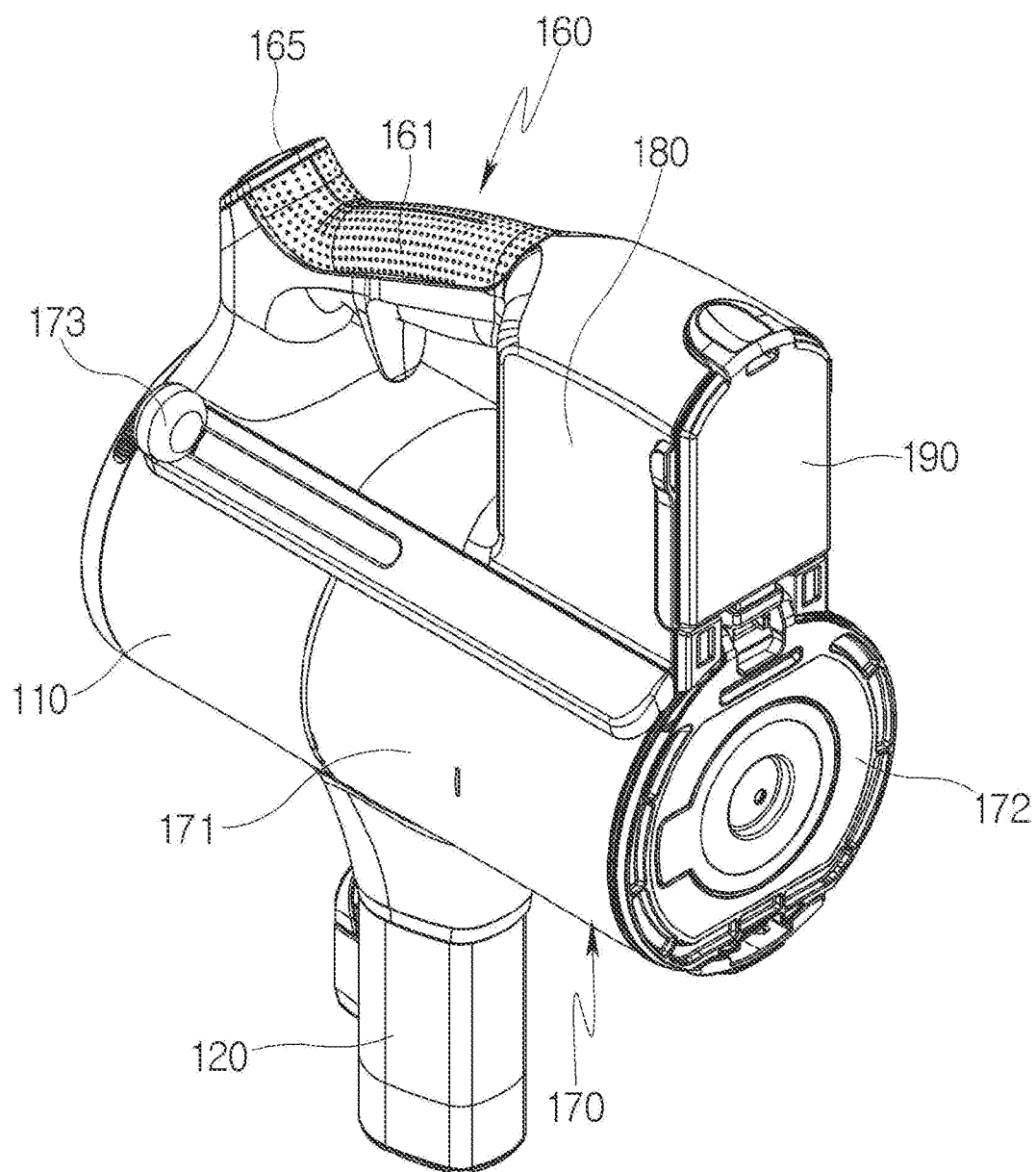
Dec. 3, 2021 (KR) 10-2021-0172189



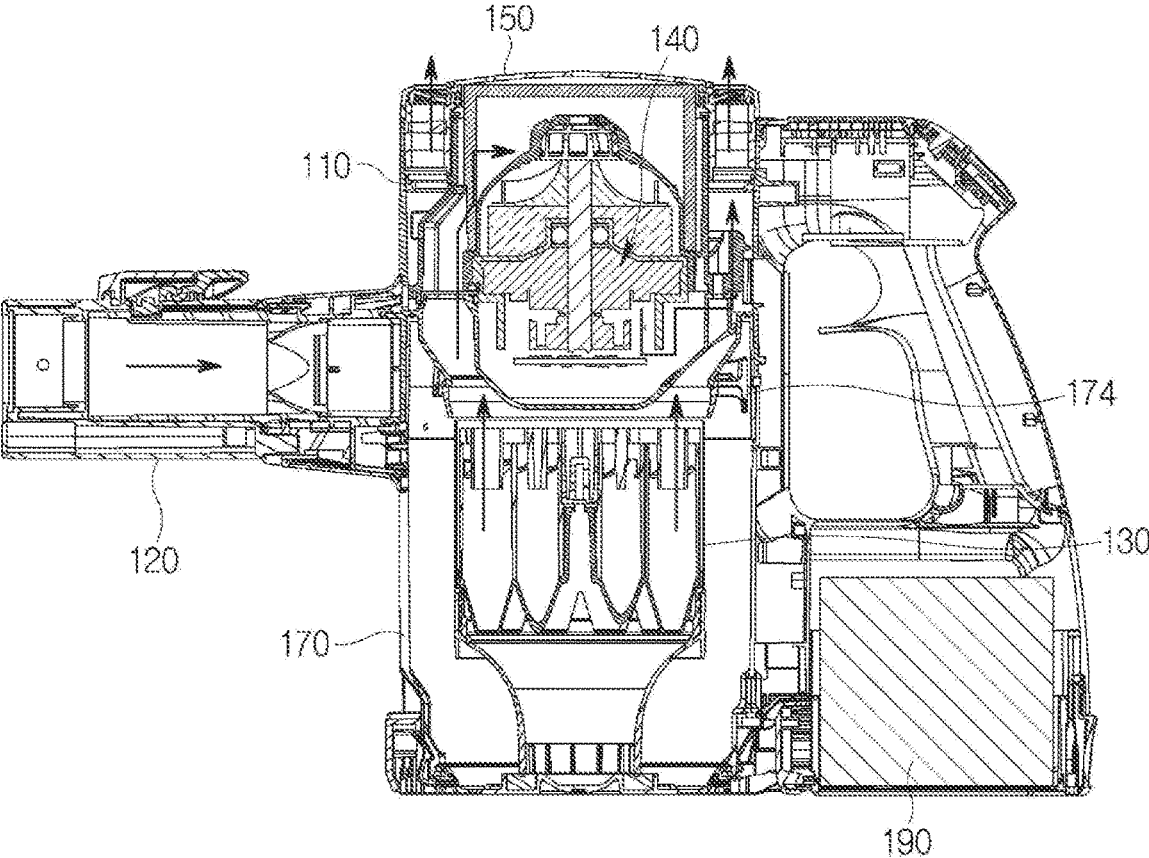
[FIG. 1]



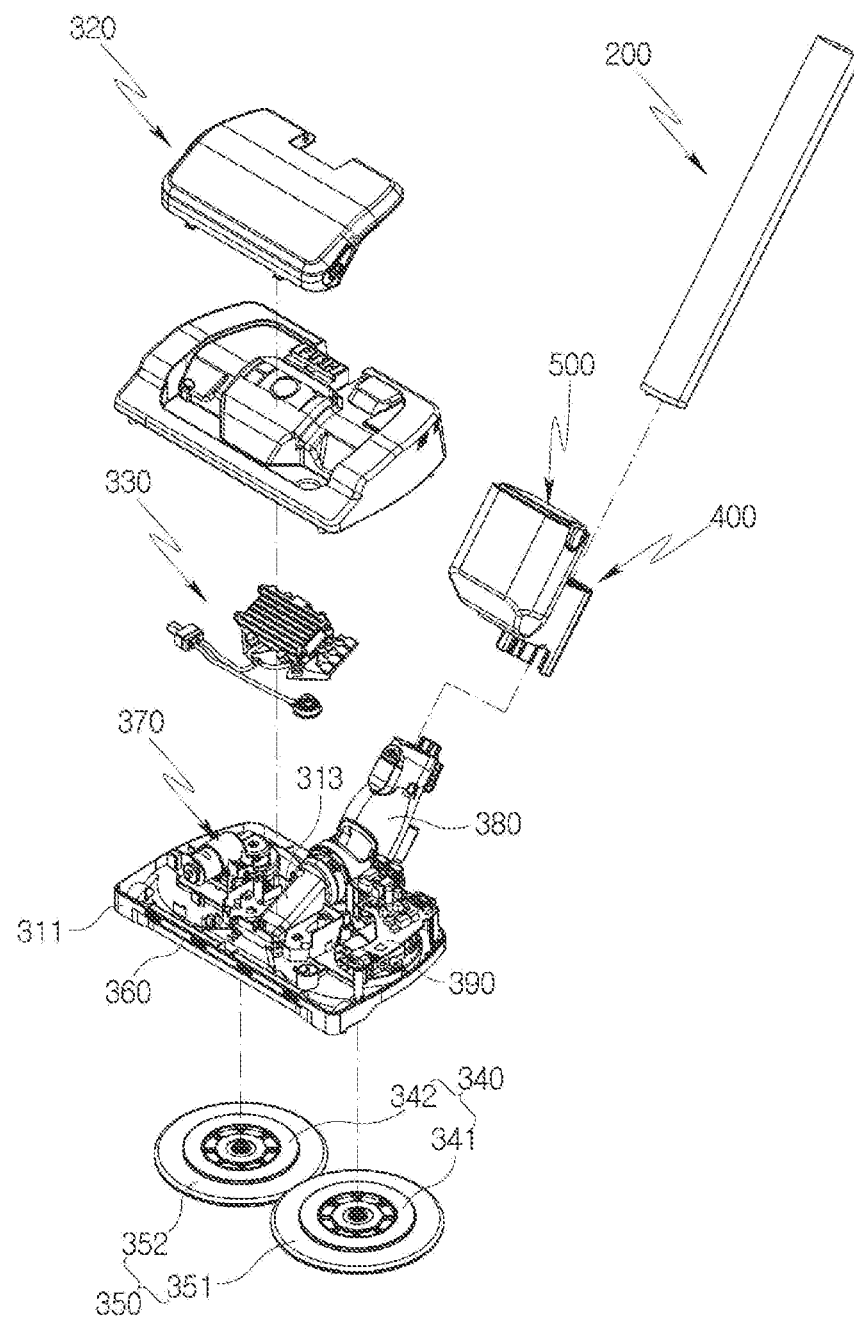
[FIG. 2]



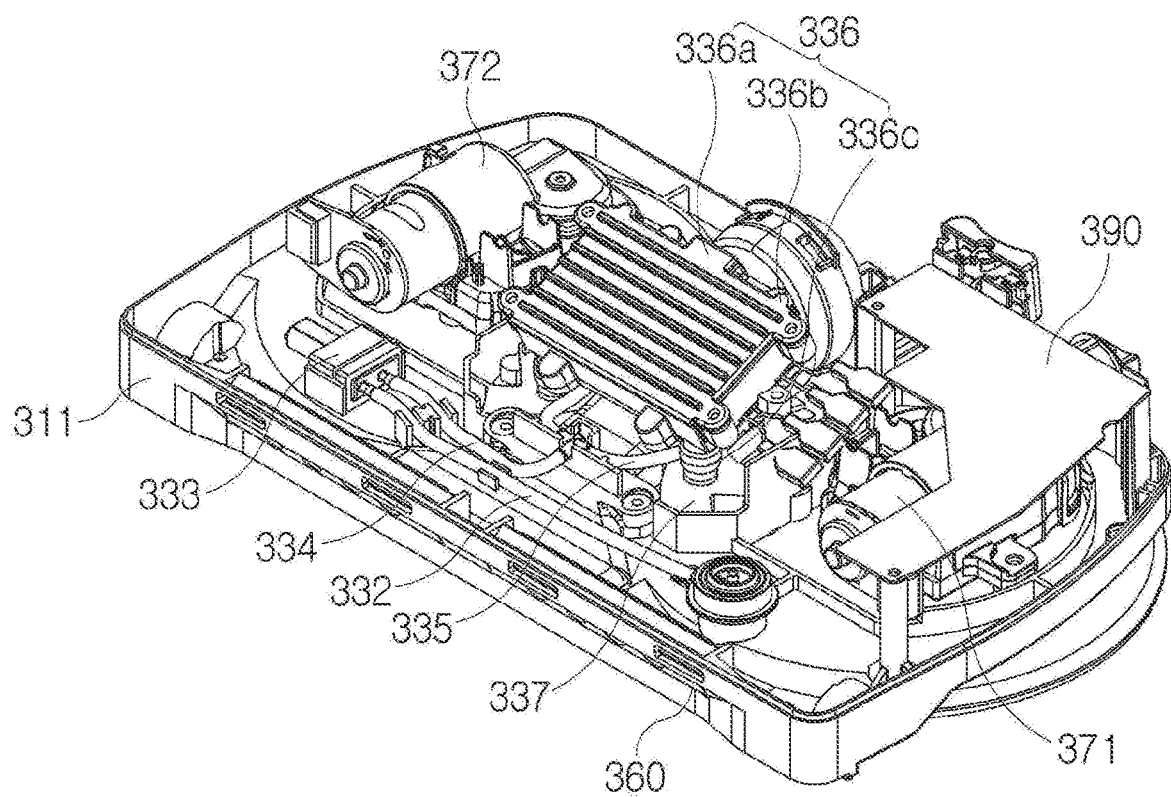
[FIG. 3]



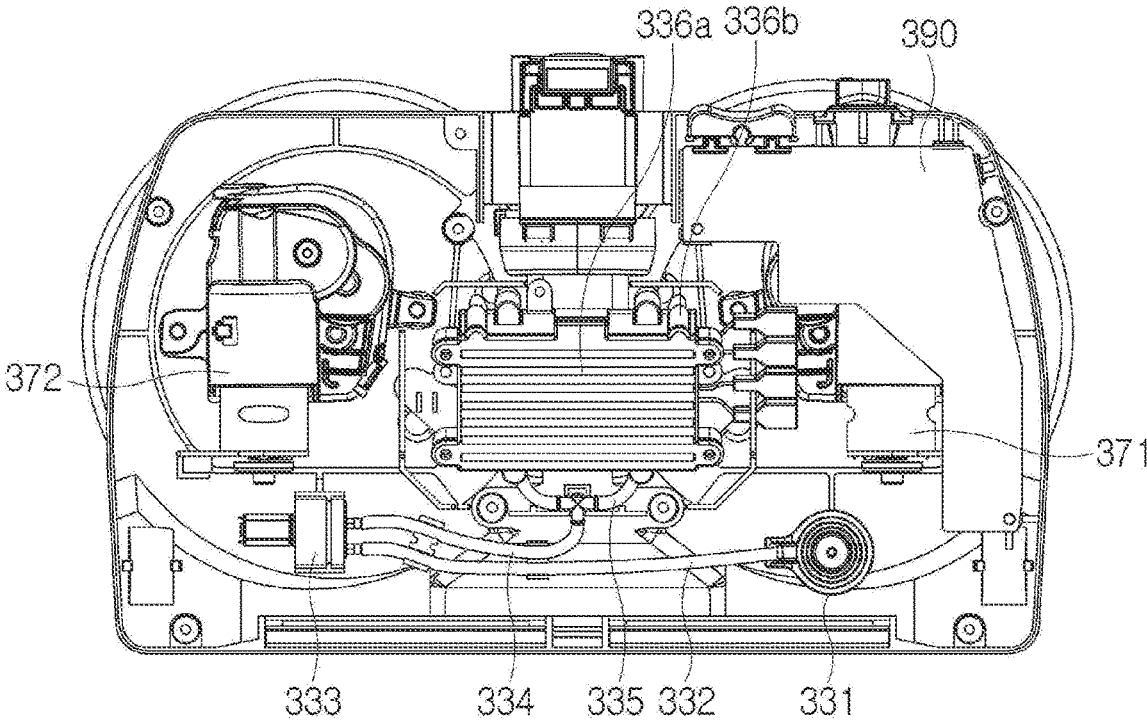
[FIG. 4]



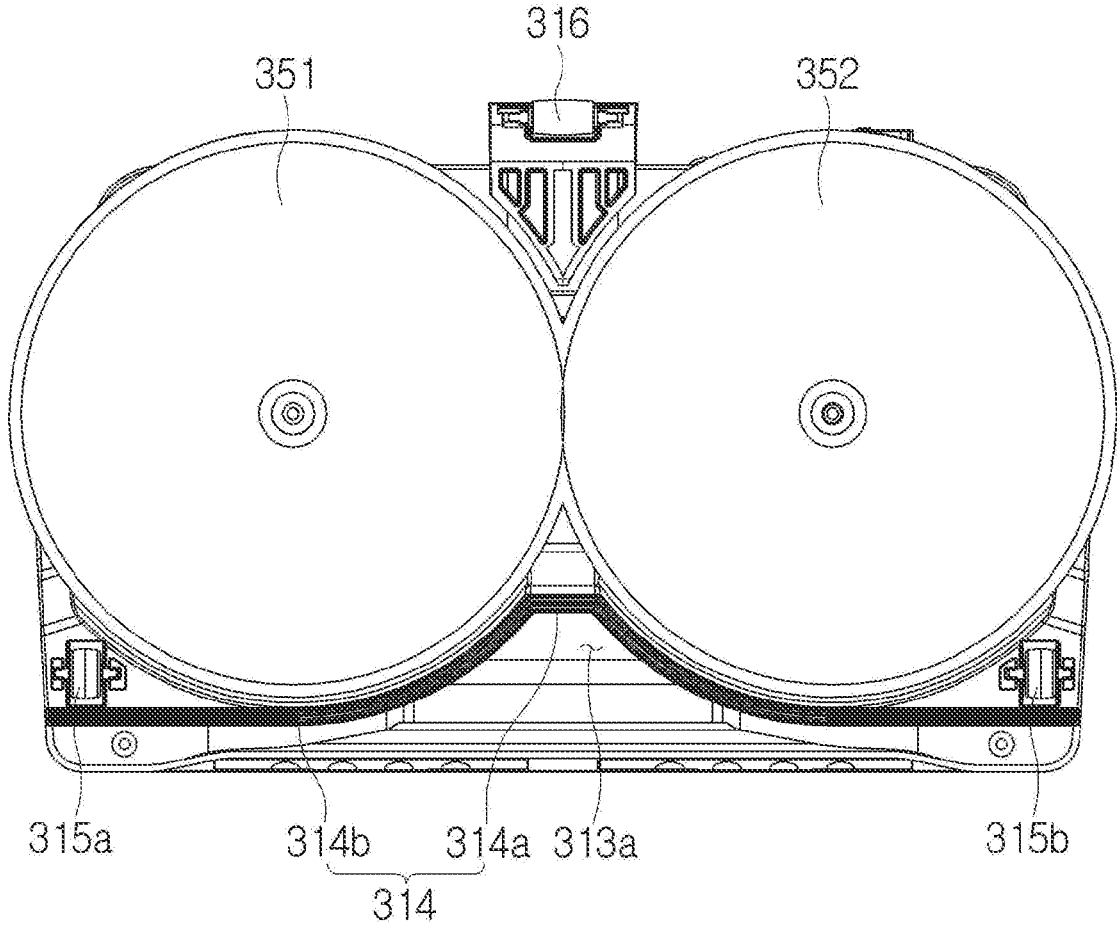
[FIG. 5]



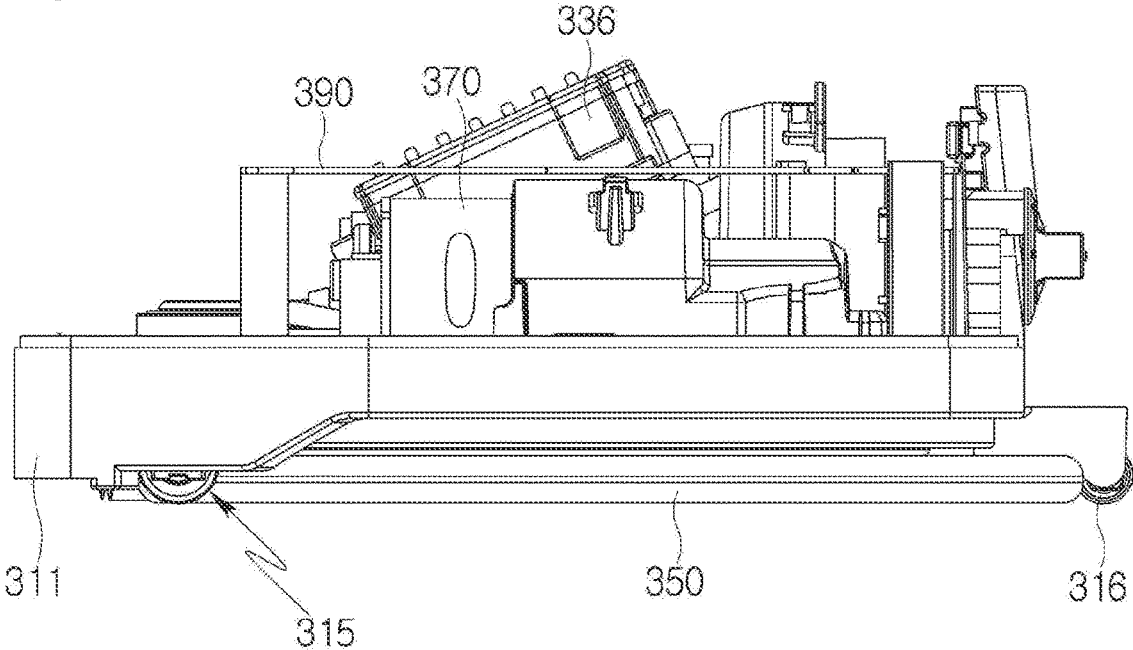
[FIG. 6]



[FIG. 7]

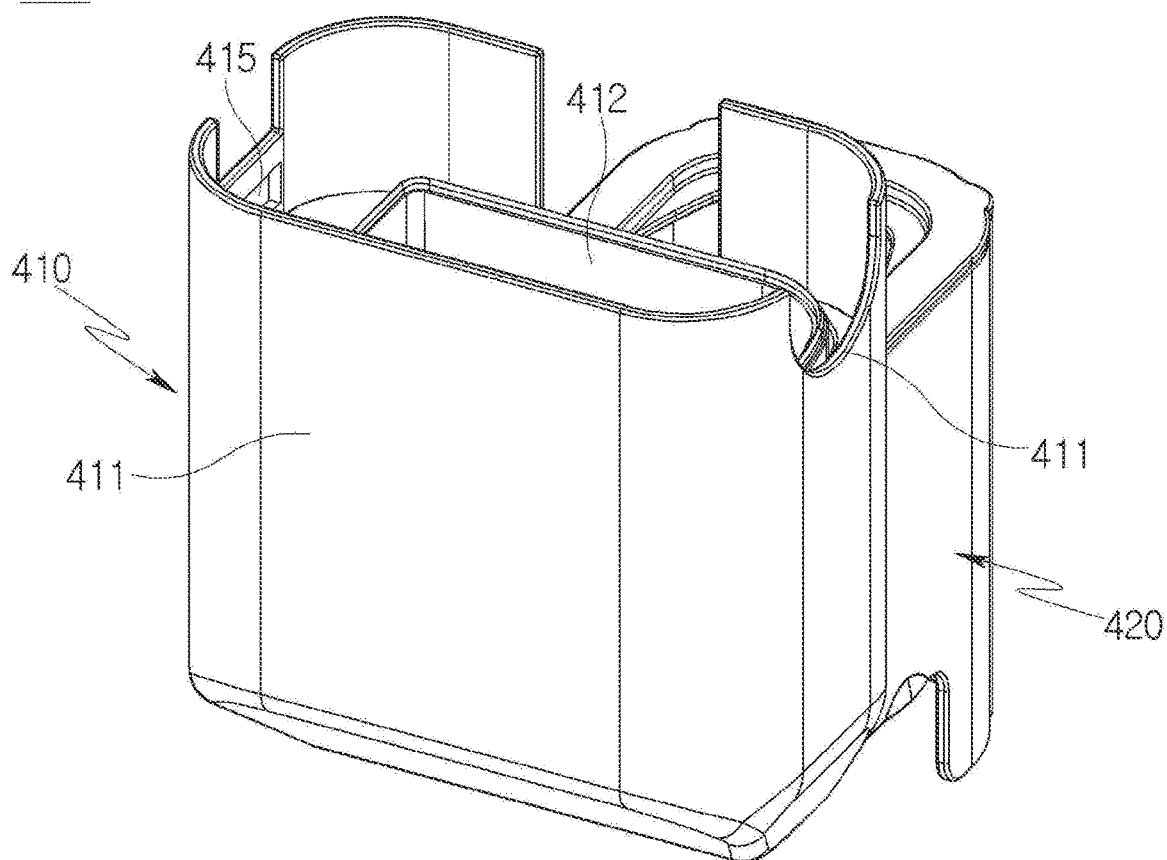


[FIG. 8]

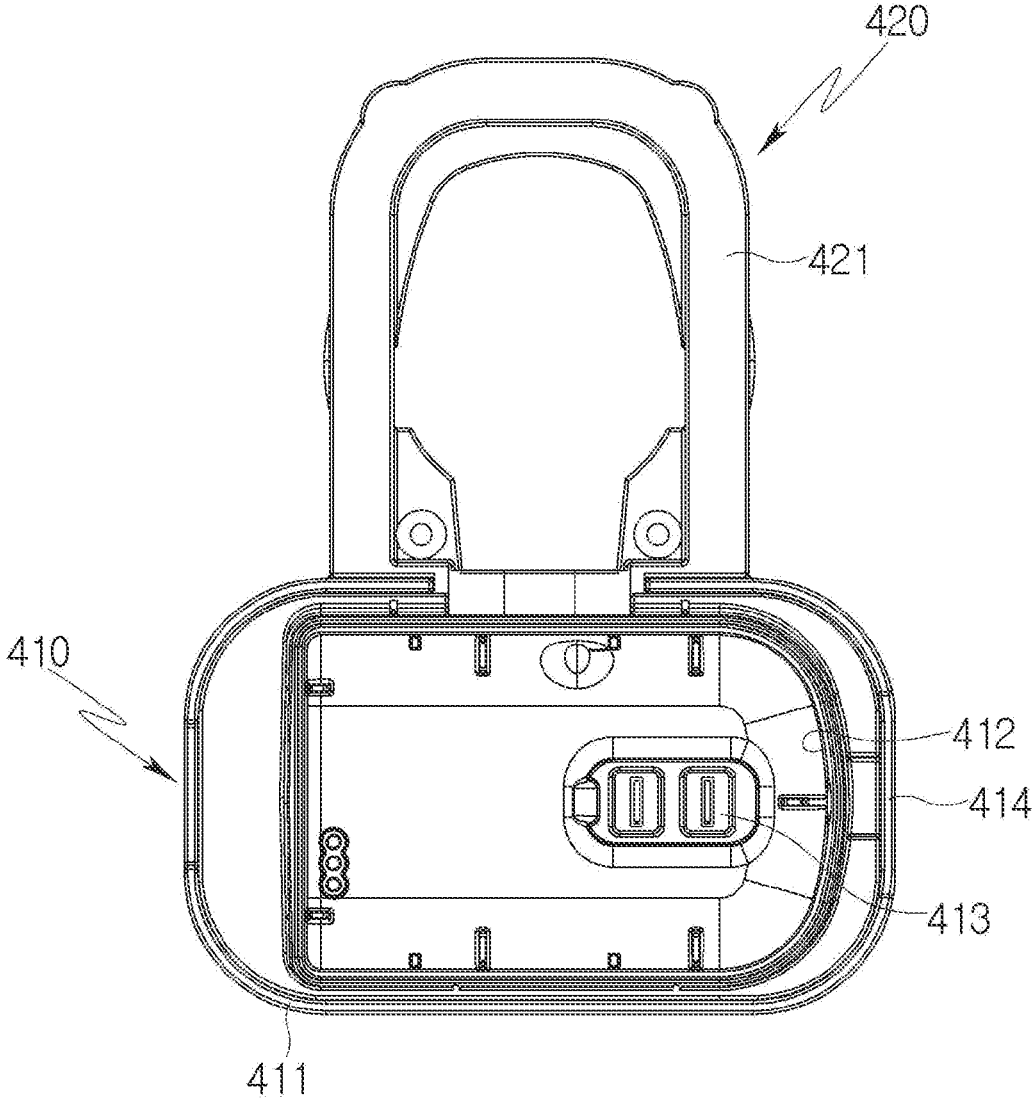


[FIG. 9]

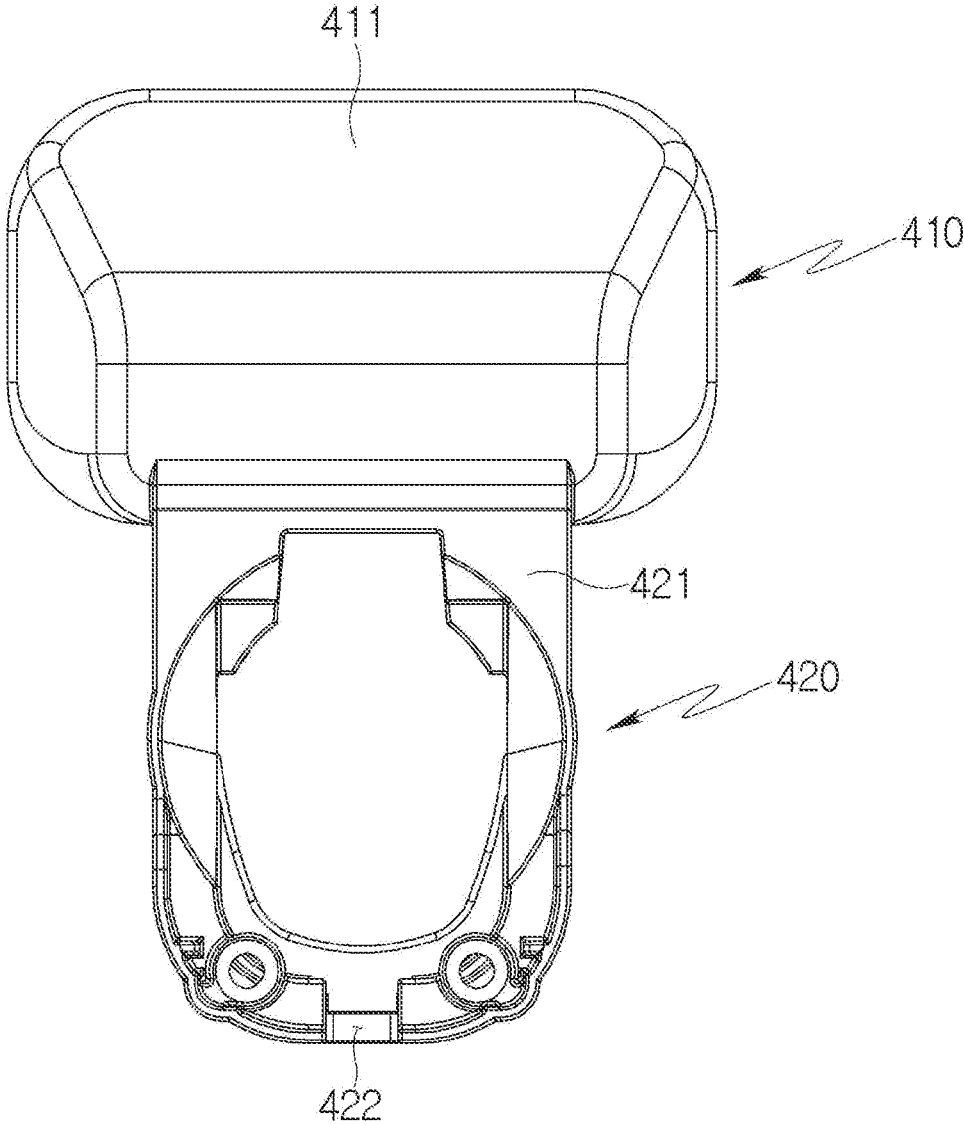
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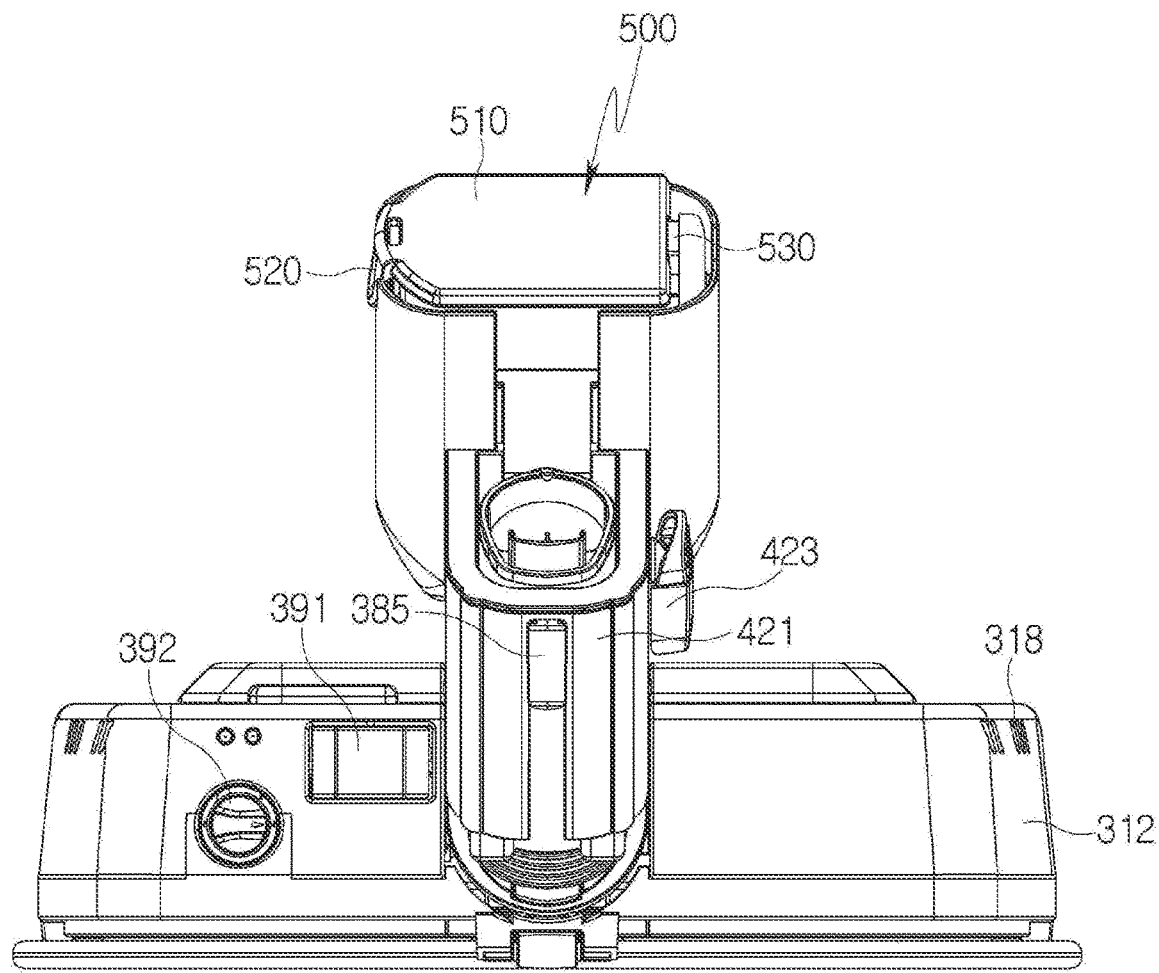
[FIG. 10]



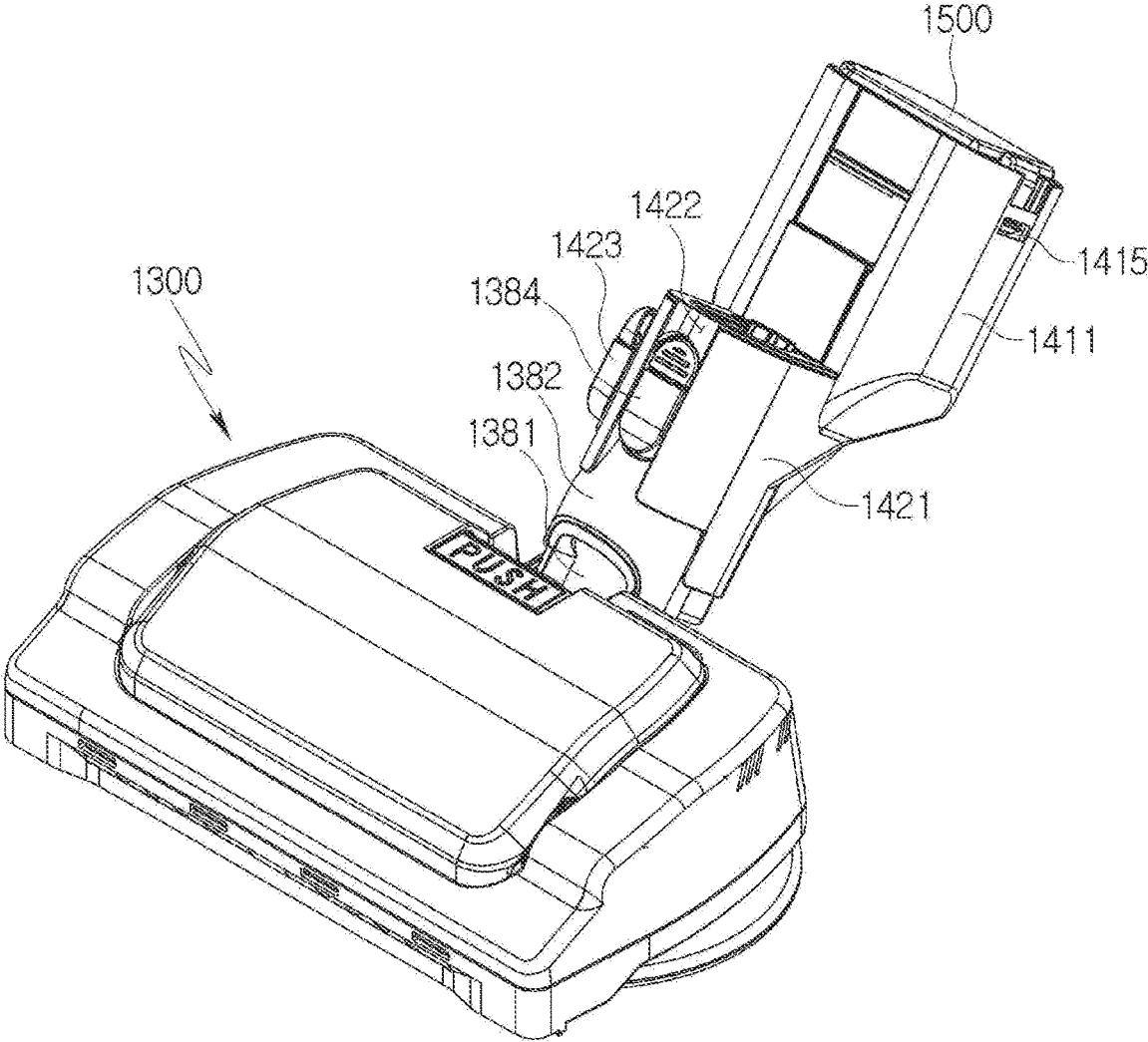
[FIG. 11]



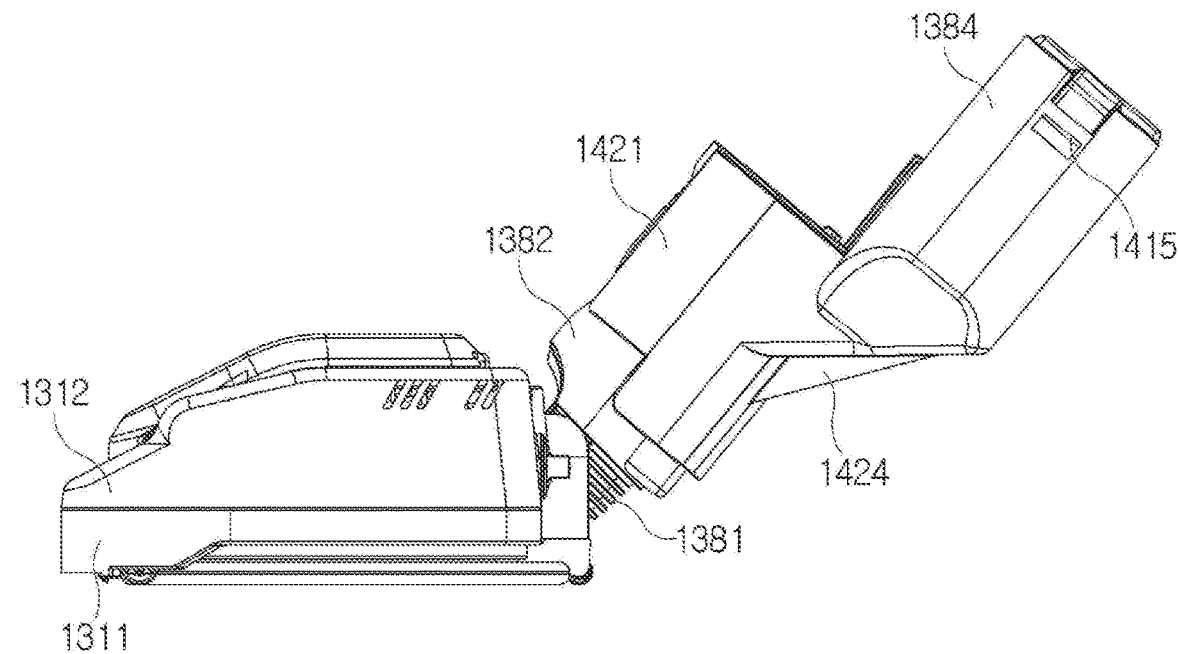
[FIG. 12]



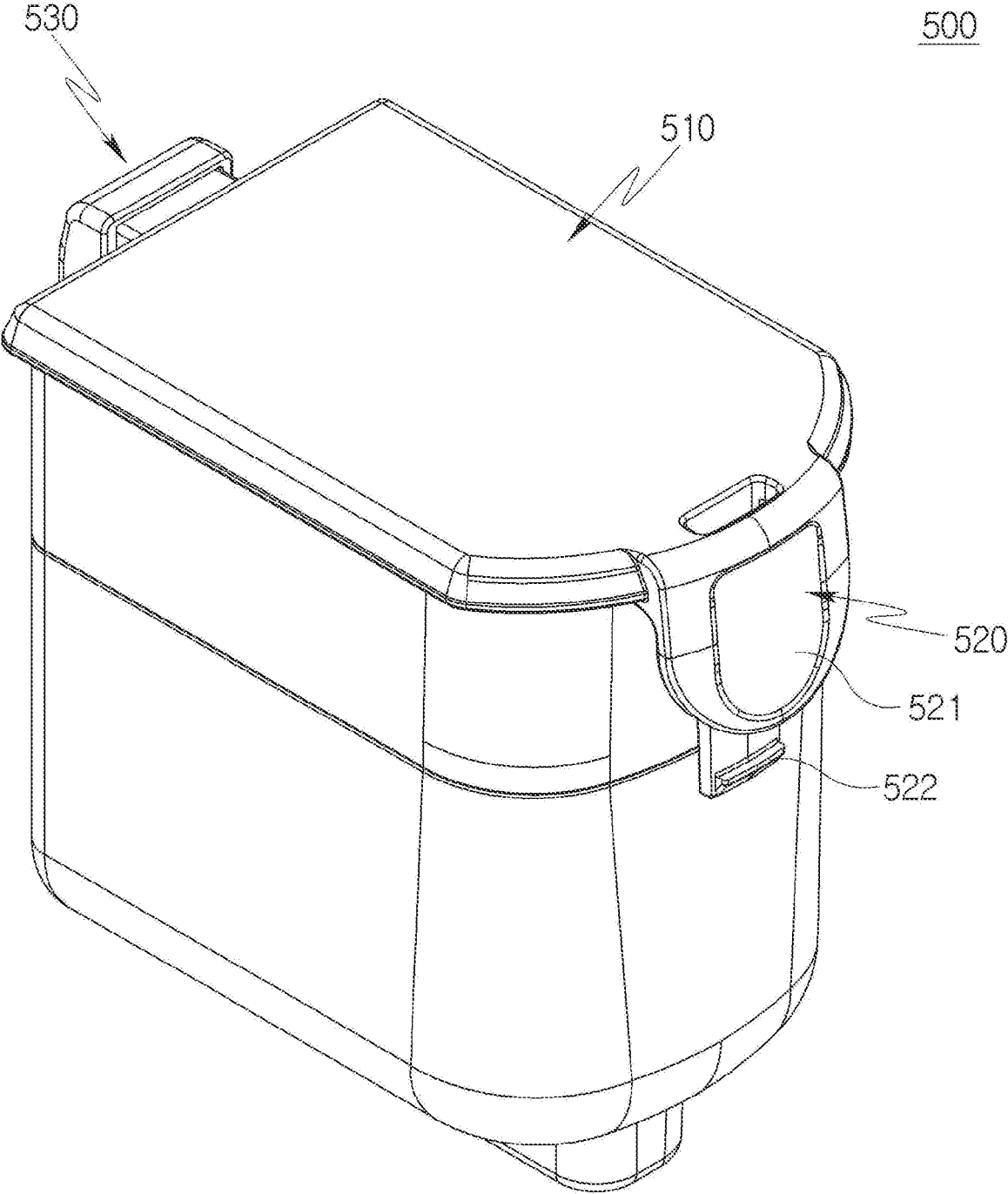
[FIG. 13]



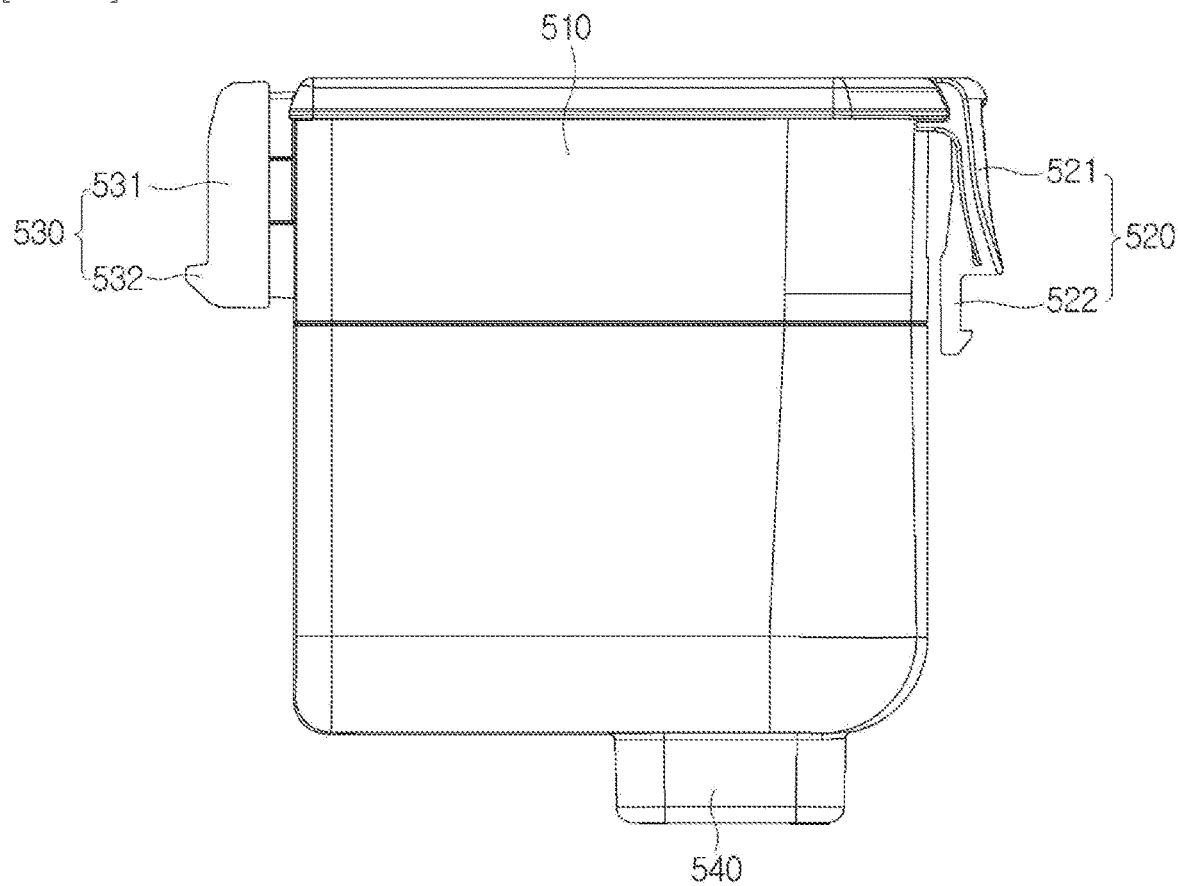
[FIG. 14]



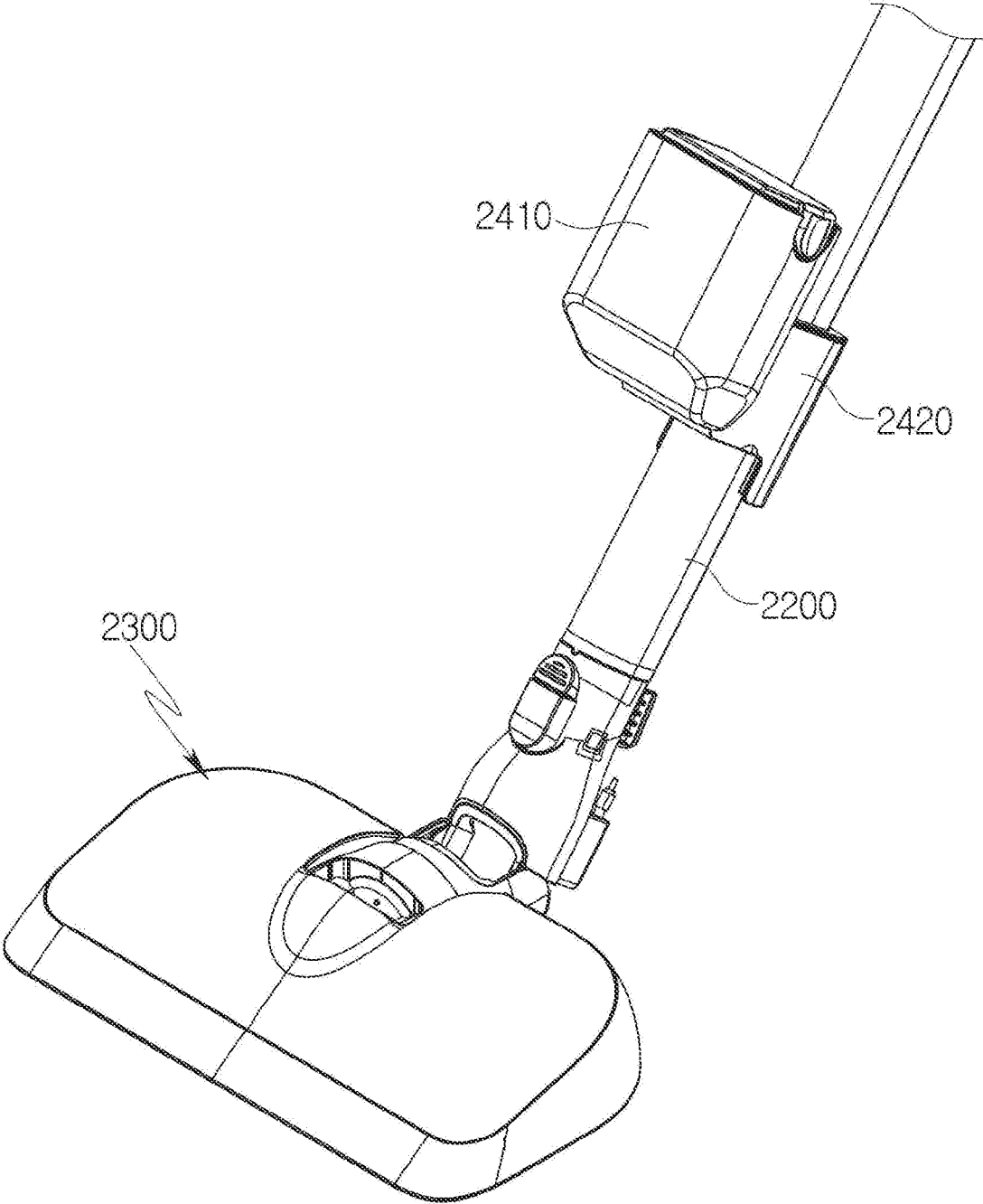
[FIG. 15]



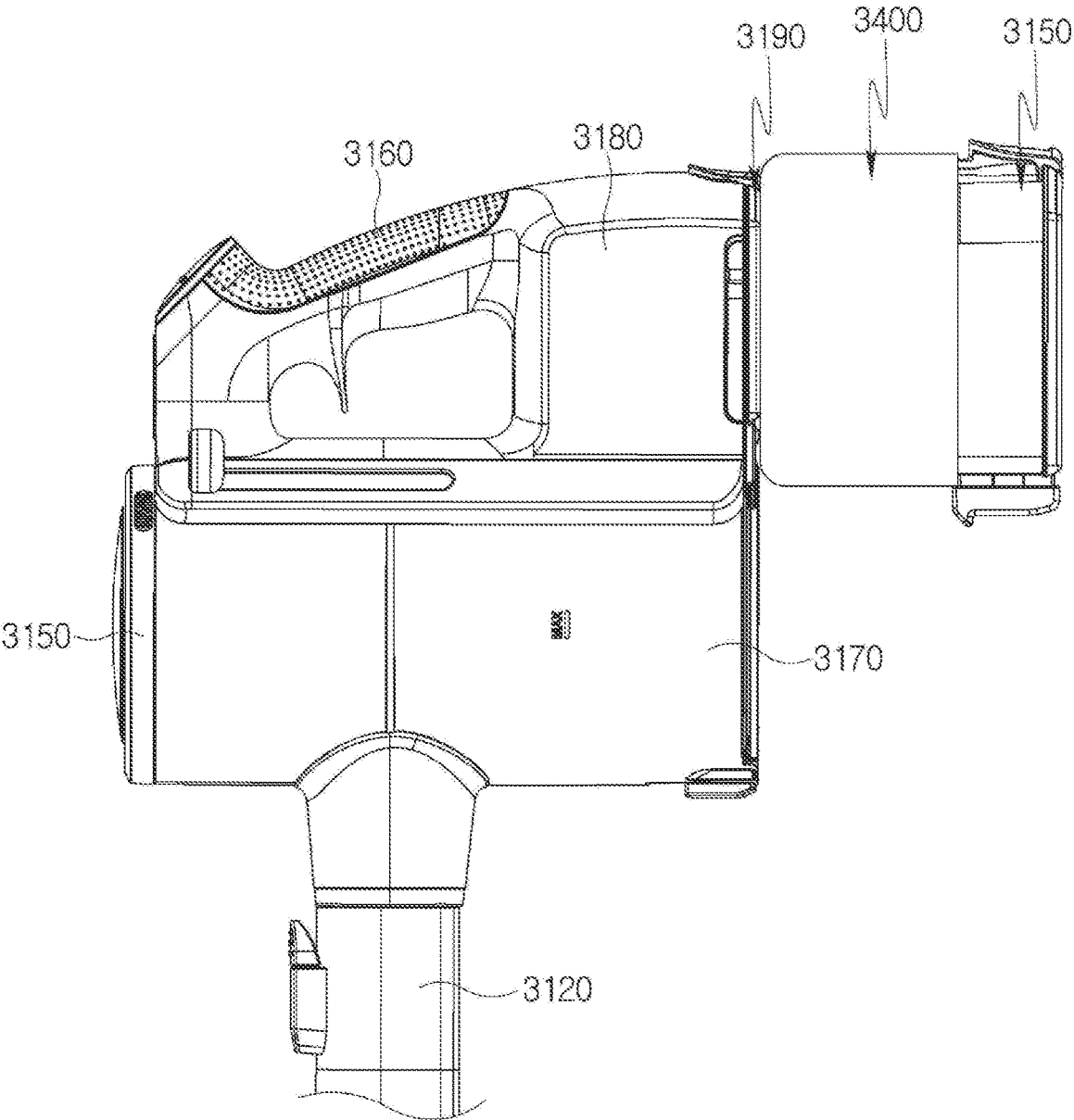
[FIG. 16]



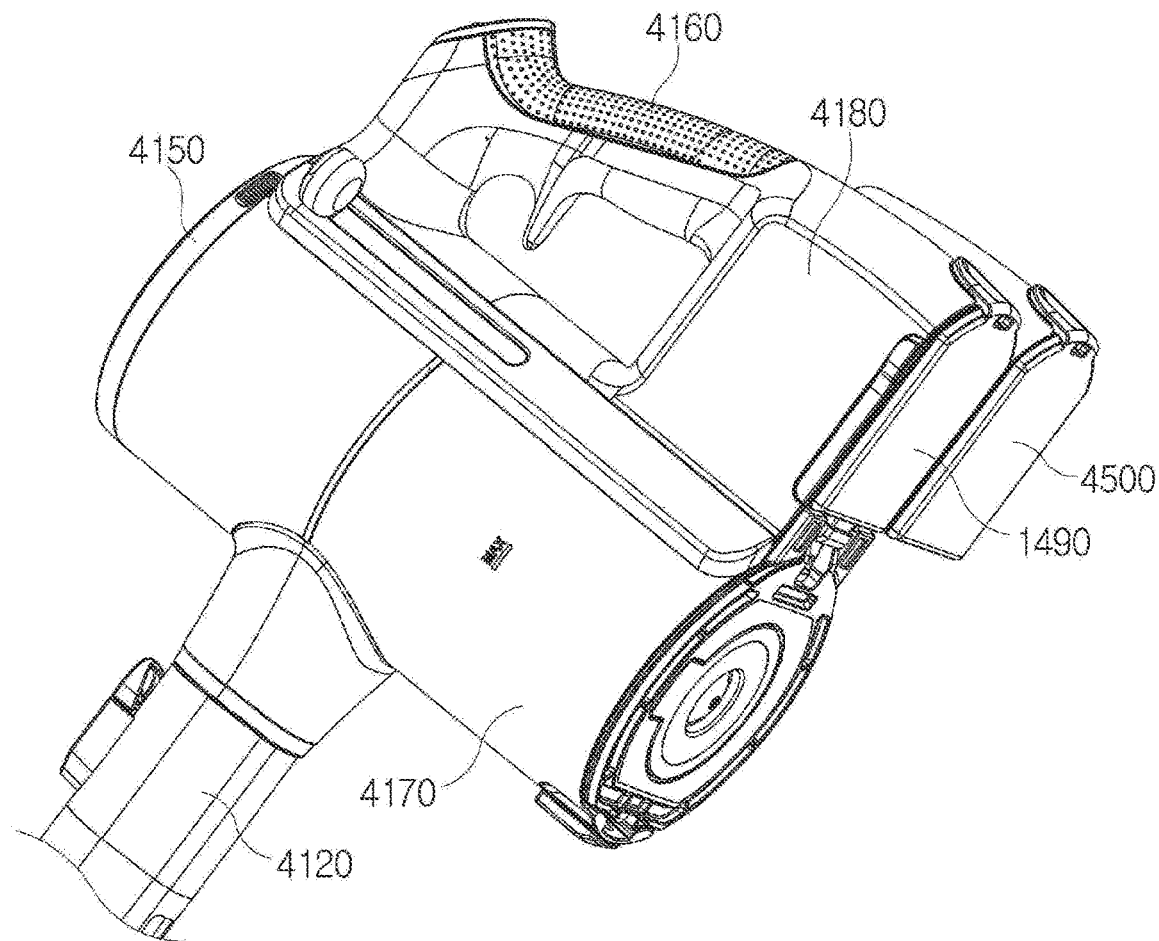
[FIG. 17]



[FIG. 18]



[FIG. 19]



CLEANER

TECHNICAL FIELD

[0001] The present disclosure relates to a cleaner, and more particularly, to a cleaner including a cleaning module detachably provided, the cleaning module being configured to suck dust or debris from a target cleaning region and wipe the target cleaning region by discharging water to a mop.

BACKGROUND ART

[0002] A cleaner refers to a device that cleans a target cleaning region by sucking dust or debris or wiping the target cleaning region.

[0003] The cleaners may be classified into a manual cleaner which is moved directly by a user to perform a cleaning operation, and an automatic cleaner which performs a cleaning operation while autonomously traveling.

[0004] The handy cleaner (hand vacuum cleaner) has maximized portability and is light in weight. However, because the handy cleaner has a short length, there may be a limitation to a cleaning region. Therefore, the handy cleaner is used to clean a local place such as a desk, a sofa, or an interior of a vehicle.

[0005] A user may use the stick cleaner while standing and thus may perform a cleaning operation without bending his/her waist. Therefore, the stick cleaner is advantageous for the user to clean a wide region while moving in the region. The handy cleaner may be used to clean a narrow space, whereas the stick cleaner may be used to clean a wide space and also used to a high place that the user's hand cannot reach. Recently, modularized stick cleaners are provided, such that types of cleaners are actively changed and used to clean various places.

[0006] Methods of cleaning floors are broadly classified into a dry-cleaning method and a wet-cleaning method. The dry-cleaning method refers to a method of wiping up or sucking dust, and a vacuum cleaner in the related art uses the dry-cleaning method. The wet-cleaning method refers to a method of performing a cleaning operation by wiping up the dust with a wet mop. As another wet-cleaning method, there is a method of sterilizing and cleaning a floor by producing and spraying high-temperature steam.

[0007] Recently, various cleaning methods have been proposed to cope with the use of various building materials. In the related art, because the floors are mainly made of wooden materials, only the dry-cleaning method is performed because the wet-cleaning method cannot be performed. However, recently, the floors are made of various materials such as steel sheets or marble, and therefore, the wet-cleaning method can be performed.

[0008] In the related art, a dry-cleaning dedicated cleaner is used to perform the dry-cleaning method, and a wet-cleaning dedicated cleaner is used to perform the wet-cleaning method. However, a user is inconvenienced because the user needs to purchase the two types of cleaners to clean various types of floors. To solve the above-mentioned problem, research has been conducted on a cleaner including a single main body, a dry-cleaning module, and a wet-cleaning module and configured such that the dry-cleaning module is mounted on the main body to perform the dry-cleaning method and the wet-cleaning module is mounted on the main body to perform the wet-cleaning method.

[0009] The wet-cleaning module includes a water container configured to store water, a heater configured to produce steam by heating water, and a mop configured to wipe a floor by receiving water or steam. The respective components may be configured into a single assembly so that the respective components may be easily replaced. For example, when the dry-cleaning module is mounted on the main body in a state in which the water container or the heater is disposed on the main body, the unnecessary component may hinder the cleaning operation. Therefore, the water container or the heater may be disposed on the wet-cleaning module instead of being mounted on the main body to ensure ease of cleaning, ease of module replacement, or spatial utilization.

[0010] Korean Utility Model Registration No. KR0489070YI discloses a wet mop cleaner in which a main battery is provided in a cleaning module, and an auxiliary battery is detachably coupled to an extension tube.

[0011] However, the wet mop cleaner cannot suck dust and uses a majority of power to rotate a mop, and the coupled auxiliary battery is just used to increase the time for which the cleaner is used.

[0012] In addition, when debris adheres to the floor, the debris may still remain on the floor even though the cleaner configured to wipe the floor surface by rotating the mop wipes the floor by rotating the mop with absorbed water.

[0013] In addition, in a case in which microorganisms and the like proliferate on the floor, there is a limitation in perfectly eliminating the microorganisms even though the cleaner wipes the floor by rotating the mop with absorbed water.

[0014] To solve the above-mentioned problem, a method of heating water to be supplied to the mop may be considered. However, it is necessary to supply a large amount of power to the cleaning module in the case in which the heater is additionally mounted in the cleaning module and uses a large amount of power to heat the water.

[0015] Korean Patent No. KR0738478B1 discloses a cleaner capable of performing steam cleaning and sucking dust.

[0016] The cleaner is configured by combining a steam cleaner and a vacuum cleaner and supply power from the steam cleaner to the vacuum cleaner.

[0017] However, since the cleaner supplies power on the basis of the steam cleaner that uses a large amount of power, the cleaner needs to receive power in a wired manner or use a large-scale battery, which causes a limitation in applying the concept of this cleaner to a handy cleaner.

[0018] Therefore, it is necessary to supply a large amount of power to the cleaning module to heat water, and further, it is necessary to maintain the time for which the entire cleaner may perform the cleaning operation.

[0019] In addition, to increase a capacity of a battery having a relatively heavy weight, it is necessary to distribute the weight so that the user does not feel discomfort when using the cleaner.

DISCLOSURE

Technical Problem

[0020] The present disclosure has been made in an effort to solve the above-mentioned problems of the cleaner in the related art in which the cleaning module having the steam

generator is detachably coupled, and an object of the present disclosure is to provide a cleaner having a battery with an increased total capacity.

[0021] Another object of the present disclosure is to provide a cleaner capable of improving sterilization and debris removing effects by supplying high-temperature water or steam to a mop.

[0022] Still another object of the present disclosure is to provide a cleaner capable of supplying additional power and being easily manipulated.

[0023] Yet another object of the present disclosure is to provide a cleaner capable of stably supplying power when the cleaning module produces steam.

Technical Solution

[0024] To achieve the above-mentioned objects, the present disclosure provides a cleaner including: a cleaner main body including a battery and a handle configured to be grasped by a user; a cleaning module detachably coupled to the cleaner main body and configured to eliminate debris on a floor surface; an auxiliary battery housing detachably coupled to the cleaning module; and an auxiliary battery detachably coupled to the auxiliary battery housing and configured to supply power to the cleaner main body or the cleaning module.

[0025] The cleaner according to the present disclosure may further include an extension tube configured to connect the cleaning module and the cleaner main body, and the auxiliary battery housing may be disposed between the extension tube and the cleaning module.

[0026] The auxiliary battery may be inclined downward and inserted into and coupled to the auxiliary battery housing.

[0027] A direction in which the auxiliary battery is inserted may have an angle of 0 degrees or more and less than 90 degrees with respect to a longitudinal direction of the extension tube.

[0028] In a state in which the auxiliary battery is coupled to the auxiliary battery housing and the extension tube and the cleaning module are coupled, the auxiliary battery may be disposed to be farther from the floor than is a portion where the extension tube and the cleaning module are in contact with each other.

[0029] The cleaning module may include a connection tube to which the extension tube and the auxiliary battery housing are coupled, and an upper end of the auxiliary battery may be disposed to be farther from the floor surface than is an upper end of the connection tube in a state in which the auxiliary battery is coupled to the auxiliary battery housing and the auxiliary battery housing is coupled to the connection tube.

[0030] Alternatively, in a cleaner according to a second embodiment, when the cleaning module cleans the floor surface in a state in which the auxiliary battery is coupled to the auxiliary battery housing and the extension tube and the cleaning module are coupled, at least a part of the auxiliary battery may be disposed to be closer to the floor surface than is the extension tube.

[0031] In this case, the cleaning module may include a connection tube to which the extension tube and the auxiliary battery housing are coupled, and a lower end of the auxiliary battery may be disposed to be closer to the floor surface than is a lower end of the connection tube in a state

in which the auxiliary battery is coupled to the auxiliary battery housing and the auxiliary battery housing is coupled to the connection tube.

[0032] Meanwhile, in the cleaner according to the present disclosure, the auxiliary battery may be connected in series to the battery.

[0033] Alternatively, the auxiliary battery may be connected in parallel to the battery.

[0034] Alternatively, the auxiliary battery may be connected selectively in series or in parallel to the battery.

[0035] In the cleaner according to the present disclosure, the cleaning module may include: at least one mop configured to wipe the floor surface; and a mop driving motor configured to provide a rotational force to the mop.

[0036] The cleaning module may include: a water tank configured to store water; and a diffuser configured to discharge moisture, which is supplied from the water tank, to the mop.

[0037] The cleaning module may further include a steam generator configured to heat water introduced from the water tank and supply the heated water to the diffuser.

[0038] In this case, the auxiliary battery may supply power to the steam generator.

[0039] A cleaner according to a third embodiment of the present disclosure may further include an extension tube configured to connect the cleaning module and the cleaner main body; and an auxiliary battery housing detachably coupled to the extension tube and configured such that the auxiliary battery is detachably coupled to the auxiliary battery housing.

[0040] A cleaner according to a fourth embodiment of the present disclosure may further include an auxiliary battery housing to which the auxiliary battery is detachably coupled, the cleaner main body may include a battery housing configured to accommodate the battery, and the auxiliary battery housing may be detachably coupled to the battery housing.

Advantageous Effect

[0041] The cleaner according to the present disclosure described above is equipped with the auxiliary battery, which makes it possible to increase the total capacity of the battery.

[0042] It is possible to improve the sterilization and debris removing effects by supplying high-temperature water or steam to the mop by means of the heater.

[0043] It is possible for the user to easily manipulate the cleaner while supplying additional power by using the auxiliary battery.

[0044] It is possible to stably supply power when the auxiliary battery supplies additional power to the heater and the cleaning module produces steam.

DESCRIPTION OF DRAWINGS

[0045] FIG. 1 is a perspective view illustrating a cleaner according to an embodiment of the present disclosure.

[0046] FIG. 2 is a perspective view for explaining a cleaner main body according to the embodiment of the present disclosure.

[0047] FIG. 3 is a cross-sectional view for explaining the cleaner main body according to the embodiment of the present disclosure.

[0048] FIG. 4 is an exploded perspective view for explaining a cleaning module according to the embodiment of the present disclosure.

[0049] FIG. 5 is a perspective view a state in which an upper housing is removed from the cleaning module according to the embodiment of the present disclosure.

[0050] FIG. 6 is a top plan view of FIG. 5.

[0051] FIG. 7 is a bottom plan view of FIG. 5.

[0052] FIG. 8 is a side view of FIG. 5.

[0053] FIG. 9 is a view for explaining an auxiliary battery housing of the cleaner according to the embodiment of the present disclosure.

[0054] FIG. 10 is a top plan view of FIG. 9.

[0055] FIG. 11 is a bottom plan view of FIG. 9.

[0056] FIG. 12 is a rear view for explaining a state in which the auxiliary battery housing is coupled to the cleaning module of the cleaner according to the embodiment of the present disclosure.

[0057] FIG. 13 is a view for explaining a state in which an auxiliary battery housing is coupled to a cleaning module of a cleaner according to a second embodiment of the present disclosure.

[0058] FIG. 14 is a side view of FIG. 13.

[0059] FIG. 15 is a view for explaining the auxiliary battery of the cleaner according to the embodiment of the present disclosure.

[0060] FIG. 16 is a front view of FIG. 15.

[0061] FIG. 17 is a view for explaining a state in which an auxiliary battery housing is coupled to an extension tube of a cleaner according to a third embodiment of the present disclosure.

[0062] FIG. 18 is a view for explaining a state in which an auxiliary battery housing is coupled to a cleaner main body of a cleaner according to a fourth embodiment of the present disclosure.

[0063] FIG. 19 is a view for explaining a state in which an auxiliary battery housing is coupled to a cleaner main body of a cleaner according to a fifth embodiment of the present disclosure.

MODE FOR INVENTION

[0064] Hereinafter, exemplary embodiments of the present disclosure will be described in detail with reference to the accompanying drawings.

[0065] The present disclosure may be variously modified and may have various embodiments, and particular embodiments illustrated in the drawings will be specifically described below. The description of the embodiments is not intended to limit the present disclosure to the particular embodiments, but it should be interpreted that the present disclosure is to cover all modifications, equivalents and alternatives falling within the spirit and technical scope of the present disclosure.

[0066] In the description of the present disclosure, the terms such as “first” and “second” may be used to describe various constituent elements, but the constituent elements may not be limited by the terms. These terms are used only to distinguish one constituent element from another constituent element. For example, a first component may be named a second component, and similarly, the second component may also be named the first component, without departing from the scope of the present disclosure.

[0067] The term “and/or” may include any and all combinations of a plurality of the related and listed items.

[0068] When one constituent element is described as being “coupled” or “connected” to another constituent element, it should be understood that one constituent element can be coupled or connected directly to another constituent element, and an intervening constituent element can also be present between the constituent elements. When one constituent element is described as being “coupled directly to” or “connected directly to” another constituent element, it should be understood that no intervening constituent element is present between the constituent elements.

[0069] The terminology used herein is used for the purpose of describing particular embodiments only and is not intended to limit the present disclosure. Singular expressions may include plural expressions unless clearly described as different meanings in the context.

[0070] The terms “comprises,” “comprising,” “includes,” “including,” “containing,” “has,” “having” or other variations thereof are inclusive and therefore specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof.

[0071] Unless otherwise defined, all terms used herein, including technical or scientific terms, may have the same meaning as commonly understood by those skilled in the art to which the present disclosure pertains. The terms such as those defined in a commonly used dictionary may be interpreted as having meanings consistent with meanings in the context of related technologies and may not be interpreted as ideal or excessively formal meanings unless explicitly defined in the present application.

[0072] Further, the following embodiments are provided to more completely explain the present disclosure to those skilled in the art, and shapes and sizes of elements illustrated in the drawings may be exaggerated for a more apparent description.

[0073] FIG. 1 is a perspective view illustrating a cleaner according to an embodiment of the present disclosure, FIG. 2 is a perspective view for explaining a cleaner main body according to the embodiment of the present disclosure, and FIG. 3 is a cross-sectional view for explaining the cleaner main body according to the embodiment of the present disclosure.

[0074] The term “floor surface” used in the present specification may mean not only a floor surface of a room such as a living room but also a cleaning surface such as a carpet.

[0075] Referring to FIGS. 1 to 3, a cleaner 1 according to the embodiment of the present disclosure may include a cleaner main body 100 having a suction motor 140 configured to generate a suction force, a cleaning module 300 connected to the cleaner main body 100 and configured to clean the floor surface by wiping the floor surface while sucking air and debris, and an extension tube 200 configured to connect the cleaner main body 100 and the cleaning module 300.

[0076] A structure of the cleaner main body 100 will be described below.

[0077] Meanwhile, in the embodiment of the present disclosure, directions may be defined on the basis of when a bottom surface (lower surface) of a dust bin 170 and a bottom surface (lower surface) of a battery housing 180 are placed on the ground surface.

[0078] In this case, a forward direction may mean a direction in which a suction part 120 is disposed on the basis

of the suction motor **140**, and a rearward direction may mean a direction in which a handle **160** is disposed. Further, on the basis of a state in which the suction part **120** is viewed from the suction motor **140**, a rightward direction may refer to a direction in which a component is disposed at the right, and a left direction may refer to a direction in which a component is disposed at the left. In addition, in the embodiment of the present disclosure, upper and lower sides may be defined in a direction perpendicular to the ground surface on the basis of the state in which the bottom surface (lower surface) of the dust bin **170** and the bottom surface (lower surface) of the battery housing **180** are placed on the ground surface.

[0079] The cleaner **1** may include the cleaner main body **100**. The cleaner main body **100** may include a main body housing **110**, the suction part **120**, a dust separating part **130**, the suction motor **140**, an air discharge cover **150**, the handle **160**, the dust bin **170**, the battery housing **180**, and a battery **190**.

[0080] The main body housing **110** may define an external appearance of the cleaner main body **100**. The main body housing **110** may provide a space that may accommodate the suction motor **140** and a filter (not illustrated) therein. The main body housing **110** may be formed in a shape similar to a cylindrical shape.

[0081] The suction part **120** may protrude outward from the main body housing **110**. For example, the suction part **120** may be formed in a cylindrical shape with an opened inside. The suction part **120** may be coupled to the extension tube **200**. The suction part **120** may provide a flow path (hereinafter, referred to as a 'suction flow path') through which air containing dust may flow.

[0082] The dust separating part **130** may communicate with the suction part **120**. The dust separating part **130** adopts a principle of a dust collector using a centrifugal force to separate the dust sucked into the cleaner main body **100** through the suction part **120**. A space in the dust separating part **130** may communicate with a space in the dust bin **170**.

[0083] For example, the dust separating part **130** may have one or more cyclone parts capable of separating dust by using a cyclone flow. Further, the space in the dust separating part **130** may communicate with the suction flow path. Therefore, air and dust, which are introduced through the suction part **120**, spirally flow along an inner circumferential surface of the dust separating part **130**. Therefore, the cyclone flow may be generated in the internal space of the dust separating part **130**.

[0084] The suction motor **140** may generate a suction force for sucking air. The suction motor **140** may be accommodated in the main body housing **110**. The suction motor **140** may generate the suction force by rotating. For example, the suction motor **140** may be formed in a shape similar to a cylindrical shape.

[0085] The air discharge cover **150** may be disposed at one side of the main body housing **110** based on an axial direction. The air discharge cover **150** may accommodate the filter for filtering air. For example, an HEPA filter may be accommodated in the air discharge cover **150**.

[0086] The handle **160** may be grasped by a user. The handle **160** may be disposed rearward from the suction motor **140**. For example, the handle **160** may be formed in a shape similar to a cylindrical shape. Alternatively, the handle **160** may be formed in a curved cylindrical shape. The

handle **160** may be disposed at a predetermined angle with respect to the main body housing **110**, the suction motor **140**, or the dust separating part **130**.

[0087] The handle **160** may include a grip portion **161** formed in a column shape so that the user may grasp the grip portion **161**, a first extension portion connected to one end of the grip portion **161** based on the longitudinal direction (axial direction) of the grip portion **161** and extending toward the suction motor **140**, and a second extension portion connected to the other end of the grip portion **161** based on the longitudinal direction (axial direction) of the grip portion **161** and extending toward the dust bin **170**.

[0088] An upper side of the handle **160** may define an external appearance of a part of an upper side of the cleaner **1**.

[0089] An operating part **165** may be disposed on the handle **160**. The operating part **165** may be disposed on an inclined surface formed in an upper region of the handle **160**.

[0090] The user may input a command for operating or stopping the cleaner **1** through the operating part **165**.

[0091] The dust bin **170** may communicate with the dust separating part **130**. The dust bin **170** may store the dust separated by the dust separating part **130**.

[0092] The dust bin **170** may include a dust bin main body **171**.

[0093] The dust bin main body **171** may provide a space capable of storing the dust separated from the dust separating part **130**. For example, the dust bin main body **171** may be formed in a shape similar to a cylindrical shape.

[0094] For example, the dust bin main body **171** may be configured such that a lower side of the dust bin main body **171** may be opened. In this case, a discharge cover **172** may be provided at the lower side of the dust bin main body **171** and selectively open the lower side of the dust bin main body **171**.

[0095] Meanwhile, according to the embodiment, the dust bin **170** may further include a dust bin compression lever **173** and a compression member **174**.

[0096] The dust bin compression lever **173** may be disposed outside the dust bin **170** or the dust separating part **130**. The dust bin compression lever **173** may be disposed outside the dust bin **170** or the dust separating part **130** so as to be movable upward and downward. The dust bin compression lever **173** may be connected to the compression member **174**. When the dust bin compression lever **173** is moved downward by external force, the compression member **174** may also be moved downward. Therefore, it is possible to provide convenience for the user. The compression member **174** and the dust bin compression lever **173** may return back to original positions by an elastic member (not illustrated). Specifically, when the external force applied to the dust bin compression lever **173** is eliminated, the elastic member may move the dust bin compression lever **173** and the compression member **174** upward.

[0097] The compression member **174** may be disposed in the dust bin main body **171**. The compression member **174** may move in the internal space of the dust bin main body **171**. Specifically, the compression member **174** may move upward or downward in the dust bin main body **171**. Therefore, the compression member may compress downward the dust in the dust bin main body **171**. In addition, when the discharge cover **172** is separated from the dust bin main body **171** and thus the lower side of the dust bin **170**

is opened, the compression member 174 may move from an upper side of the dust bin 170 to the lower side of the dust bin 170, thereby removing debris such as residual dust in the dust bin 170. Therefore, it is possible to improve the suction force of the cleaner by preventing the residual dust from remaining in the dust bin 170. Further, it is possible to remove an offensive odor caused by the residual dust by preventing the residual dust from remaining in the dust bin 170.

[0098] The battery 190 may be accommodated in the battery housing 180. The battery housing 180 may be disposed at a lower side of the handle 160.

[0099] For example, the battery housing 180 may have a hexahedral shape opened at a lower side thereof. A rear side of the battery housing 180 may be connected to the handle 160. In this case, the battery housing 180 may include an accommodation portion opened at a lower side thereof. With this configuration, the battery 190 may be attached or detached through the accommodation portion of the battery housing 180.

[0100] As another example, the battery housing 180 and the battery 190 may be integrated in a state in which the battery housing 180 accommodates the battery 190.

[0101] The battery 190 serves to supply power to the cleaner 1. Specifically, the battery 190 may supply power to the suction motor 140 and supply power to an electronic circuit and an electronic component through electric wires embedded in the cleaner 1. In addition, the battery 190 may supply power to the cleaning module 300.

[0102] In a case in which the battery 190 is coupled to the battery housing 180, a lower side of the battery 190 may be exposed to the outside. Because the battery 190 may be placed on the floor when the cleaner 1 is placed on the floor, the battery 190 may be immediately separated from the battery housing 180. In addition, because the lower side of the battery 190 is exposed to the outside and thus in direct contact with air outside the battery 190, performance of cooling the battery 190 may be improved.

[0103] Meanwhile, in a case in which the battery 190 is fixed integrally to the battery housing 180, the number of structures for attaching or detaching the battery 190 and the battery housing 180 may be reduced, and as a result, it is possible to reduce an overall size of the cleaner 1 and a weight of the cleaner 1.

[0104] The cleaner 1 may include the extension tube 200.

[0105] The extension tube 200 may be coupled to the cleaner main body 100 and the cleaning module 300.

[0106] For example, the extension tube 200 may be formed in a long cylindrical shape. Therefore, an internal space of the extension tube 200 may communicate with an internal space of the cleaning module 300. In addition, the extension tube 200 may communicate with the suction flow path formed in the suction part 120 of the cleaner main body 100.

[0107] When the suction force is generated by the suction motor 140, the suction force may be provided to the cleaning module 300 through the suction part 120 and the extension tube 200. Therefore, outside dust and air may be introduced into the cleaner main body 100 through the cleaning module 300 and the extension tube 200. In addition, dust and air introduced through the cleaning module 300 may pass through the extension tube 200 and then be introduced into the cleaner main body 100. Further, the dust and air, which has been introduced into the cleaner main body 100 and has

passed through the suction part 120, may be separated from the dust separating part 130, the dust may be stored in the dust bin 170, and the air may be discharged to the outside through the air discharge cover 150.

[0108] Meanwhile, an electric wire may be embedded in the extension tube 200. Therefore, the cleaner main body 100 and the cleaning module 300 may be electrically connected to each other through the extension tube 200.

[0109] FIGS. 4 to 8 are views for explaining the cleaning module according to the embodiment of the present disclosure.

[0110] Referring to FIGS. 4 to 8, the cleaning module 300 according to the embodiment of the present disclosure may include a module housing 310, and a connection tube 380 connected to the module housing 310 and configured to be movable.

[0111] For example, the cleaning module 300 according to the present embodiment may be used in a state of being connected to a handy cleaner.

[0112] That is, the cleaning module 300 may be detachably connected to the cleaner main body 100 or the extension tube 200. Therefore, when the cleaning module 300 is connected to the cleaner main body 100 or the extension tube 200, the user may clean the floor surface by using the cleaning module 300. In this case, the cleaner main body 100 connected to the cleaning module 300 may separate dust in air through a multi-cyclone method.

[0113] The cleaning module 300 may be operated by power supplied from the cleaner main body 100. Specifically, the cleaning module 300 may operate by receiving power from the battery 190 of the cleaner main body 100.

[0114] Since the cleaner main body 100 connected to the cleaning module 300 includes the suction motor 140, the suction force generated by the suction motor 140 may be exerted in the cleaning module 300, such that the cleaning module 300 may suck air and debris on the floor surface.

[0115] Therefore, in the present embodiment, the cleaning module 300 serves to suck air and debris on the floor surface and guide the air and debris to the cleaner 1.

[0116] The connection tube 380 may be connected to a central portion of a rear side of the module housing 310 and guide the introduced air to the cleaner main body 100, but the present disclosure is not limited thereto.

[0117] The directions according to the present embodiment will be defined to assist in understanding the present disclosure. A portion of the cleaning module 300, which is connected to the connection tube 380, may be defined as a rear portion (rear side) of the cleaning module 300, and a portion of the cleaning module 300 opposite to the connection tube 380 may be defined as a front portion (front side) of the cleaning module 300.

[0118] In addition, on the basis of a state in which an intake port 313a is viewed from the connection tube 380, a left of a flow path forming part 313 may be defined as a left side of the cleaning module 300, and a right side of the flow path forming part 313 may be defined as a right side of the cleaning module 300. Further, a direction in which the left and right sides are connected may be referred to as a leftward/rightward direction.

[0119] The leftward/rightward direction may mean a direction perpendicular to a forward/rearward direction on a horizontal plane.

[0120] In addition, on the basis of a state in which the cleaning module 300 is placed on the floor surface, i.e., a

state in which a mop **350** is placed on the floor surface and may wipe the floor surface, a direction toward the floor surface may be defined as a lower or downward side, and a direction away from the floor surface may be defined as an upper or upward side.

[0121] The cleaning module **300** may further include rotary cleaning units **340** rotatably provided at the lower side of the module housing **310**.

[0122] For example, a pair of rotary cleaning units **340** may be arranged in the leftward/rightward direction. In this case, the pair of rotary cleaning units **340** may be independently rotated. For example, the rotary cleaning units **340** may include a first rotary cleaning unit **341** and a second rotary cleaning unit **342**.

[0123] The rotary cleaning units **340** may be coupled to the mops **350**. For example, the mop **350** may be formed in a circular plate shape. The mops **350** may include a first mop **351** and a second mop **352**.

[0124] The mop **350** is brought into close contact with the floor surface by a load of the cleaning module **300** in the state in which the mop **350** is placed on the floor surface, such that a frictional force between the mop **350** and the floor surface increases.

[0125] The module housing **310** may define an external shape of the cleaning module **300** and have the intake port **313a** through which air is introduced. For example, the intake port **313a** may be formed at a front end of the lower side of the module housing **310**. The intake port **313a** may extend from the module housing **310** in the leftward/rightward direction.

[0126] The module housing **310** may include a lower housing **311** and an upper housing **312** coupled to an upper side of the lower housing **311**.

[0127] The rotary cleaning units **340** are mounted on the lower housing **311**, and the lower housing **311** may define an external shape of the cleaning module **300**.

[0128] The intake port **313a** may be formed in the lower housing **311**.

[0129] A board installation part may be provided on the lower housing **311**, and a printed circuit board **390** for controlling mop driving motors **370** is installed on the board installation part. For example, the board installation part may be provided in the form of a hook extending upward from the lower housing **311**.

[0130] The board installation part may be disposed on the lower housing **311** and positioned at one side of the flow path forming part **313**, but the present disclosure is not limited thereto. For example, the printed circuit board **390** may be disposed at a position adjacent to first and second operating parts **391** and **392**. Therefore, a switch installed on the printed circuit board **390** may detect operations of the first and second operating parts **391** and **392**.

[0131] Nozzle holes (not illustrated) may be formed in the lower housing **311**, and diffusers **337** may penetrate the nozzle holes. Water or steam (moisture vapor) having passed through a steam generator **336** and the diffusers **337** may be supplied to the mops **350** through the nozzle holes (not illustrated).

[0132] The upper housing **312** may cover an upper side of the lower housing **311** and define an external shape of the cleaning module **300** according to the present disclosure.

[0133] In addition, the module housing **310** may further include the flow path forming part **313** configured to define

a flow path that communicates with the intake port **313a** and guides the air introduced from the intake port **313a** to the cleaner main body **100**.

[0134] The flow path forming part **313** may be coupled to a central portion of the upper side of the lower housing **311**, and an end of the flow path forming part **313** may be connected to the connection tube **380**.

[0135] Therefore, the intake port **313a** may extend in the forward/rearward direction approximately rectilinearly as the flow path forming part **313** is arranged. Therefore, a length of the intake port **313a** may be minimized, and a loss of the flow path in the cleaning module **300** may be minimized.

[0136] A front side of the flow path forming part **313** may cover an upper side of the intake port **313a**. The flow path forming part **313** may be disposed such that the flow path forming part **313** is inclined upward in a direction from a front end to a rear side of the flow path forming part **313**.

[0137] Therefore, a height of the front side of the flow path forming part **313** may be lower than a height of the rear side of the flow path forming part **313**.

[0138] According to the present embodiment, the height of the front side of the flow path forming part **313** is low, which makes it possible to reduce a height of a front side of the cleaning module **300** on the basis of an overall height of the cleaning module **300**. The lower the height of the cleaning module **300**, the higher the likelihood that the cleaning module **300** enters a narrow space below furniture or a chair and cleans the narrow space. A blocker **314** is disposed on a bottom surface of the lower housing **311**. The blocker **314** may block a front space in which the intake port **313a** is disposed and a rear space in which the mops **350** are disposed, thereby preventing moisture discharged from the mops **350** from being diffused to the intake port **313a**. For example, the blocker **314** may include a central portion **314a** and extension portions **314b**. In this case, a pair of extension portions **314b** may be symmetrically connected to two opposite ends on the basis of the central portion **314a**. Further, the central portion **314a** may be disposed at a rear side of the intake port **313a** and prevent the moisture from flowing toward the intake port **313a**. Further, the extension portion **314b** may have an arc shape and surround the circular mop **350**.

[0139] A plurality of rollers may be provided at the lower side of the lower housing **311** and allow the cleaning module **300** to move smoothly.

[0140] For example, front rollers **315** may be disposed on the lower housing **311** and positioned at front sides of the mops **350**. The front rollers **315** may include a first roller **315a** and a second roller **315b**. The first roller **315a** and the second roller **315b** may be disposed to be spaced apart from each other in the leftward/rightward direction.

[0141] The first and second rollers **315a** and **315b** may be rotatably connected to shafts, respectively. The shaft may be fixed to the lower side of the lower housing **311** in a state in which the shaft extends in the leftward/rightward direction.

[0142] A distance between the shaft and a front end of the lower housing **311** may be longer than a minimum distance between the mop **350** and the front end of the lower housing **311**.

[0143] For example, the rotary cleaning units **340** may be at least partially positioned between the shaft of the first roller **315a** and the shaft of the second roller **315b**.

[0144] With this arrangement, the rotary cleaning units 340 may be positioned maximally close to the intake port 313a, and an area of the floor surface, on which the cleaning module 300 is positioned and the rotary cleaning units 340 performs a cleaning operation, may be increased, such that the performance in cleaning the floor may be improved.

[0145] In the present embodiment, the first and second rollers 315a and 315b are coupled to the lower side of the lower housing 311, which makes it possible to improve mobility of the cleaning module 300.

[0146] A third roller 316 may be further provided on the lower side of the lower housing 311. Therefore, the first and second rollers 315a and 315b and the third roller 316 may support the cleaning module 300 at three points. In this case, the third roller 316 may be positioned at a lower side of the mop 350 so as not to interfere with the mop 350.

[0147] The module housing 310 may have a cooling air inlet port 317 and a cooling air discharge port 318.

[0148] The lower housing 311 may have the cooling air inlet port 317. The outside air may be introduced into the module housing 310 through the cooling air inlet port 317. In addition, the cooling air inlet port 317 may be formed in a front sidewall of the lower housing 311. With this configuration, when the cleaning module 300 is moved forward by the user's manipulation, the amount of air to be introduced may increase.

[0149] The upper housing 312 may have the cooling air discharge port 318. Air in the module housing 310 may be discharged to the outside through the cooling air discharge port 318. In addition, the cooling air discharge ports 318 may be formed in sidewall at two opposite sides of the upper housing 312. With this configuration, the air introduced through the cooling air inlet port 317 may be guided to pass through the mop driving motor 370 while the air flows toward the cooling air discharge port 318, which makes it possible to prevent the mop driving motor 370 from being overheated.

[0150] Further, on the basis of the state in which the lower housing 311 is placed on the floor surface, the cooling air discharge port 318 may be disposed to be farther from the ground surface than is the cooling air inlet port 317. With this configuration, the heated air may be moved upward in the module housing 310 and effectively discharged through the cooling air discharge port 318.

[0151] The cleaning module 300 may further include a water tank 320 capable of supplying a water to the mop 350.

[0152] The water tank 320 may be separably connected to the module housing 310. Specifically, the water tank 320 is mounted on a water container seating portion formed on the upper housing 312.

[0153] In addition, the water tank 320 may be disposed above the steam generator 336. Specifically, the water tank 320 is disposed above the steam generator 336 and spaced apart from the steam generator 336. That is, the water tank 320 may be disposed above the steam generator 336 with the upper housing 312 interposed therebetween.

[0154] The water tank 320 may define an external appearance of the cleaning module 300 in the state in which the water tank 320 is mounted on the module housing 310.

[0155] The entire upper sidewall of the water tank 320 may substantially define an upper external appearance of the cleaning module 300. Therefore, the user may visually check whether the water tank 320 is mounted on the module housing 310.

[0156] The module housing 310 may further include a water tank separating button configured to be manipulated by the user to separate the water tank 320 in the state in which the water tank 320 is mounted on the module housing 310. For example, the water tank separating button may be positioned on the central portion of the cleaning module 300. Therefore, the user easily recognizes the water tank separating button and manipulate the water tank separating button.

[0157] In the state in which the water tank 320 is mounted on the module housing 310, water in the water tank 320 may be supplied to the mops 350.

[0158] Specifically, a space capable of storing water is formed in the water tank 320. The water stored in the water tank 320 may be supplied to the steam generator 336 through at least one hose. The water introduced into the steam generator 336 may be heated and changed in phase into steam (moisture vapor) depending on the user's selection. The water heated by the steam generator 336 may be supplied to the mops 350 through the diffuser 337.

[0159] The water tank 320 includes a water supply port. The water supply port is a hole through which the water is introduced into the water tank 320. For example, the water supply port may be formed in a lateral surface of the water tank 320.

[0160] The water tank 320 includes a drain port. The drain port is a hole through which the water stored in the water tank 320 is discharged. The water discharged from the drain port may flow to the steam generator 336. The drain port may be formed in a lower surface of the water tank 320.

[0161] The water tank 320 includes an air hole. The air hole is a hole through which air may be introduced into the water tank 320. When the water stored in the water tank 320 is discharged to the outside, a pressure in the water tank 320 is lowered, and air may be introduced into the water tank 320 through the air hole to compensate for the lowered pressure. For example, the air hole may be formed at an upper end of the water tank 320.

[0162] The cleaning module 300 according to the present disclosure may further include a moisture supply unit 330 having a flow path through which the water introduced from the water tank 320 is supplied to the mops 350.

[0163] Specifically, the moisture supply unit 330 may include a water tank connection part 331 configured to introduce water in the water tank 320 into the module housing 310, a water inlet tube 332 configured to supply the water, which is introduced into the water tank connection part 331, to a water pump 333, a guide tube 334 configured to supply the water from the water pump 333 to a T-shaped connector, and a water supply tube 335 configured to supply the water, which is introduced into the connector, to the steam generator 336.

[0164] The water tank connection part 331 may operate a valve (not illustrated) in the water tank 320, and the water may flow in the water tank connection part 331.

[0165] The water tank connection part 331 may be coupled to the lower side of the upper housing 312, and a part of the water tank connection part 331 may protrude upward while penetrating the upper housing 312.

[0166] The water tank connection part 331, which protrudes upward, may be retracted into the water tank 320 while penetrating a discharge port of the water tank 320 when the water tank 320 is seated on the upper housing 312.

[0167] The upper housing 312 may include a sealer to prevent the water discharged from the water tank 320 from leaking from a periphery of the water tank connection part 331. For example, the sealer may be made of rubber, coupled to the upper housing 312, and disposed at the upper side of the upper housing 312.

[0168] The water pump 333 may be installed on the upper housing 312 and control the discharge of the water from the water tank 320.

[0169] The water pump 333 may provide a flow force to water. The water pump 333 may include a first connection port connected to the water inlet tube 332, and a second connection port connected to the guide tube 334. In this case, on the basis of the water pump 333, the first connection port may be an inlet, and the second connection port may be an outlet.

[0170] The water pump 333 is a pump in which a valve body operates to expand or contract the water and allow the first connection port and the second connection port to communicate with each other. Because the water pump 333 may be implemented by a publicly-known structure, a detailed description thereof will be omitted.

[0171] The water supply tube 335 may connect the connector to a water inlet port 336b of the steam generator 336. For example, the water supply tube 335 may be a pair of tubes branching off from the connector.

[0172] Therefore, the water supplied to the water inlet tube 332 flows into the water pump 333 and then flows to the guide tube 334. The water flowing through the guide tube 334 flows to the water supply tube 335 by means of the connector. Further, the water flowing through the water supply tube 335 is supplied to the steam generator 336.

[0173] The steam generator 336 is a device configured to heat water. The steam generator 336 is disposed in the module housing 310. Specifically, the steam generator 336 is installed on the upper side of the lower housing 311.

[0174] The steam generator 336 includes a heating chamber 336a, the water inlet port 336b, and a moisture discharge port 336c.

[0175] A flow path is formed in the heating chamber 336a, and the water introduced from the water tank 320 may flow through the flow path. The heating chamber 336a may heat the water by receiving power from the battery 190 and/or the auxiliary battery 500. The heating chamber 336a may adjust a temperature of the water under the user's control. In addition, the heating chamber 336a may change the phase of the water to steam (moisture vapor) under the user's control.

[0176] The water inlet port 336b may be a hole formed at an inlet end of the heating chamber 336a. The water, which is stored in the water tank 320, may be introduced into the steam generator 336 through the water inlet port 336b.

[0177] The moisture discharge port 336c may be a hole formed at an outlet end of the heating chamber 336a. The water or steam may be discharged from the steam generator 336 through the moisture discharge port 336c. The moisture discharge port 336c may be connected to the diffuser 337.

[0178] Meanwhile, in the present disclosure, the steam generator 336 is disposed to be inclined. Specifically, the heating chamber 336a is disposed to be inclined at a predetermined angle with respect to the ground surface (floor surface).

[0179] For example, a rear end of the heating chamber 336a is disposed upward from a front end of the heating chamber 336a. That is, the steam generator 336 is inclined

upward in the direction toward the rear side. Therefore, the water may be heated while flowing from a rear upper side to a front lower side of the steam generator 336.

[0180] Meanwhile, the water inlet port 336b may be disposed at a rear end of the heating chamber 336a, and the moisture discharge port 336c may be disposed at a front end of the heating chamber 336a. That is, on the basis of the state in which the lower housing 311 is placed on the floor surface (ground surface), the water inlet port 336b may be disposed to be farther from the floor surface (ground surface) than is the moisture discharge port 336c. Therefore, the water is heated while flowing from the upper side to the lower side by gravity, such that the water may be discharged through the moisture discharge port 336c by the flow force of the water even though the water ascends while changing in phase into moisture vapor.

[0181] The diffuser 337 is configured to discharge the water in the water tank 320 to the mop 350.

[0182] The diffuser 337 may be accommodated in a space formed in the module housing 310. The diffuser 337 may be connected to the steam generator 336 and discharge the moisture, which is heated by the steam generator 336, to the mop 350.

[0183] For example, the pair of diffusers 337 may be mounted on the module housing 310 and arranged in the leftward/rightward direction. In addition, the pair of diffusers 337 arranged in the leftward/rightward direction may be formed symmetrically (mirror-symmetrically).

[0184] In the present embodiment, the diffuser 337 may have therein a diffusion flow path through which the moisture may flow, and the diffuser 337 may include nozzles through which the moisture flowing through the diffusion flow path is discharged to the mop.

[0185] For example, the diffuser 337 may have a circular arc shape, the nozzle may be provided in plural, and the plurality of nozzles may be disposed at predetermined intervals. With this configuration, the diffuser 337 may stably supply moisture to the mop 350 having the circular plate shape.

[0186] As another example, the diffuser 337 may have an annular shape (ring shape), and a plurality of nozzles may be disposed at predetermined intervals in a circumferential direction. In this case, the mop driving motor 370 may be disposed inside the annular diffuser. With this configuration, the diffuser 337 may quickly supply the moisture to the entire mop 350 having the circular plate shape.

[0187] The water sprayed from the diffuser 337 passes through water passing holes formed in the rotary cleaning unit 340 and then be supplied to the mop 350. The mop 350 wipes the floor while rotating in the state in which the mop 350 absorbs water supplied through the diffuser 337.

[0188] The rotary cleaning unit 340 may rotate by receiving power from the mop driving motor 370. For example, the rotary cleaning unit 340 may be a rotary plate. The rotary cleaning unit 340 may have a circular plate shape, and the mop 350 may be attached to a lower surface of the rotary cleaning unit 340.

[0189] For example, the rotary cleaning unit 340 may be disposed at the lower side of the module housing 310 and positioned at the rear side of the intake port 313a.

[0190] Therefore, when the cleaning module 300 performs the cleaning operation while moving forward, debris and air on the floor surface may be sucked into the intake port 313a, and then the floor surface may be wiped by the mop 350.

[0191] For example, the rotary cleaning units 340 may include a first rotary cleaning unit 341 connected to a first mop driving motor 371 and attached to a first mop 351, and a second rotary cleaning unit 342 connected to a second mop driving motor 372 and attached to a second mop 352.

[0192] Specifically, the rotary cleaning unit 340 may include an outer body having a circular ring shape, an inner body positioned at a central region of the outer body and spaced apart from an inner peripheral surface of the outer body, and a plurality of connection ribs configured to connect an outer peripheral surface of the inner body to the inner peripheral surface of the outer body.

[0193] In addition, the rotary cleaning unit 340 may include a plurality of water passing holes formed in a circumferential direction to supply the mop 350 with the water discharged through the diffuser 337.

[0194] Meanwhile, the rotary cleaning unit 340 may include an attachment means to which the mop 350 is attached. For example, the attachment means may be a Velcro fastener.

[0195] The rotary cleaning unit 340 may be disposed at the lower side of the lower housing 311. That is, the rotary cleaning unit 340 may be disposed outside the module housing 310.

[0196] In addition, the rotary cleaning unit 340 may be connected to the mop driving motor 370 and receive power. For example, the rotary cleaning unit 340 may be connected to the mop driving motor 370 by means of at least one gear and rotated by the operation of the mop driving motor 370.

[0197] The rotary cleaning units 340 may include the first rotary cleaning unit 341 and the second rotary cleaning unit 342.

[0198] In the present embodiment, a rotation center of the first rotary cleaning unit 341 and a rotation center of the second rotary cleaning unit 342 are spaced apart from each other in the leftward/rightward direction.

[0199] The rotation center of the rotary cleaning unit 340 may be positioned to be farther from a front end of the module housing 310 than is a central axis that bisects a length of the module housing 310 based on the forward/rearward direction. This is to prevent the rotary cleaning unit 340 from clogging the intake port 313a.

[0200] A distance between the rotation center of the first rotary cleaning unit 341 and the rotation center of the second rotary cleaning unit 342 may be larger than a diameter of the mop 350. This is to reduce friction between the first and second mops 351 and 352 caused by interference between the first and second mops 351 and 352 while the first and second mops 351 and 352 rotate and to prevent a cleanable area from being reduced by a portion in which the first and second mops 351 and 352 interfere with each other.

[0201] The mop 350 may wipe the floor surface while rotating.

[0202] The mop 350 may be coupled to a lower side of the rotary cleaning unit 340 and face the floor surface.

[0203] The mop 350 is configured such that a bottom surface of the mop 350 facing the floor has a predetermined area. The mop 350 has a flat shape. The mop 350 is configured such that a width (or diameter) of the mop 350 in a horizontal direction is sufficiently larger than a height of the mop 350 in a vertical direction. When the mop 350 is coupled to the lower housing 311, the bottom surface of the mop 350 may be in parallel with the floor surface.

[0204] The bottom surface of the mop 350 may have an approximately circular shape, and the mop 350 may have a rotationally symmetrical shape as a whole. In addition, the mop 350 may be attached to or detached from the bottom surface of the rotary cleaning unit 340. The mop 350 may be coupled to the rotary cleaning unit 340 and rotated together with the rotary cleaning unit 340.

[0205] In the state in which the rotary cleaning unit 340 is coupled to the lower side of the module housing 310, a part of the mop 350 protrudes outward from the cleaning module 300, such that the mop 350 cleans not only a portion of the floor surface positioned below the cleaning module 300 but also a portion of the floor surface positioned outward from the cleaning module 300.

[0206] For example, the mop 350 may not only protrude toward two opposite sides of the cleaning module 300 but also protrude rearward.

[0207] The mops 350 may include the first mop 351 coupled to the first rotary cleaning unit 341, and the second mop 352 coupled to the second rotary cleaning unit 342. Therefore, when the first rotary cleaning unit 341 rotates by receiving power from the first mop driving motor 371, the first mop 351 may also rotate. When the second rotary cleaning unit 342 rotates by receiving power from the second mop driving motor 372, the second mop 352 may also rotate.

[0208] Meanwhile, in the present embodiment, the cleaning module 300 may further include a light-emitting module 360.

[0209] The light-emitting module 360 may emit light to a location in front of the cleaning module 300 and allow the user to recognize debris or microorganisms existing in front of the cleaning module 300.

[0210] The light-emitting module 360 may be disposed at a front side of the module housing 310. For example, the light-emitting module 360 may be disposed on a front surface of the lower housing 311. The light-emitting module 360 may be provided in plural, and the plurality of light-emitting modules 360 may be disposed in the leftward/rightward direction. In this case, the light-emitting module 360 may be disposed rearward from the cooling air inlet port 317. With this arrangement, the light-emitting module 360 may be cooled by air introduced from the cooling air inlet port 317.

[0211] Meanwhile, the light-emitting module 360 may include a light-emitting member and a diffusion plate.

[0212] The light-emitting member may emit light to a location in front of or below the cleaning module. For example, the light-emitting member may include a plurality of LEDs. In this case, the light emitted from the light-emitting member may be visible rays. According to the embodiments, the light emitted from the light-emitting member may be infrared (IR) rays or ultraviolet (UV) ray. With this configuration, when the light-emitting member operates, the user may recognize whether debris or microorganism exists at a location in front of the cleaning module 300. Further, the light-emitting member may sterilize or eliminate debris or microorganism existing at the location in front of the cleaning module 300, thereby improving hygiene.

[0213] In addition, the diffusion plate may be disposed forward from the light-emitting member and diffuse the light emitted from the light-emitting member.

[0214] Meanwhile, the cleaning module 300 may further include the mop driving motor 370 configured to provide power for rotating the mop 350 and the rotary cleaning unit 340.

[0215] Specifically, the mop driving motors 370 may include the first mop driving motor 371 configured to rotate the first rotary cleaning unit 341, and the second mop driving motor 372 configured to rotate the second rotary cleaning unit 342.

[0216] As described above, the first and second mop driving motors 371 and 372 operates independently. Therefore, even though any one of the first and second mop driving motors 371 and 372 is broken down, the rotary cleaning unit 340 may be rotated by the other of the first and second mop driving motors 371 and 372.

[0217] Meanwhile, the first and second mop driving motors 371 and 372 may be arranged on the module housing 310 and spaced apart from each other in the leftward/rightward direction. Further, the first and second mop driving motors 371 and 372 may be positioned rearward from the intake port 313a.

[0218] The mop driving motor 370 may be disposed in the module housing 310. For example, the mop driving motor 370 may be seated on the upper side of the lower housing 311 and covered by the upper housing 312. That is, the mop driving motor 370 may be positioned between the lower and upper housings 311 and 312.

[0219] Meanwhile, the cleaning module 300 includes the connection tube 380 coupled to the cleaner main body 100 or the extension tube 200.

[0220] The connection tube 380 may include a first connection tube 381 connected to an end of the flow path forming part 313, a second connection tube 382 rotatably connected to the first connection tube 381, and a guide tube configured to allow the internal spaces of the first and second connection tubes 381 and 382 to communicate with each other.

[0221] The first connection tube 381 has a tubular shape. One axial end of the first connection tube 381 may be connected to an end of the flow path forming part 313, and the other axial end of the first connection tube 381 may be rotatably coupled to the second connection tube 382. In this case, the first connection tube 381 has a shape in which a part of an outer peripheral surface thereof is cut out. The first connection tube 381 may be disposed so that the cut-out portion is directed upward toward the second connection tube 382. With this configuration, in the state in which the cleaning module 300 is placed on the ground surface, an angle of the second connection tube 382 with respect to the ground surface may be changed by a motion of the user's hand. That is, the first and second connection tubes 381 and 382 may serve as a kind of joint capable of adjusting an angle of the cleaning module 300 and an angle of the cleaner main body 100.

[0222] The second connection tube 382 has a tubular shape. One axial end of the second connection tube 382 is rotatably coupled to the first connection tube 313, and the other axial end of the second connection tube 382 is detachably coupled as the cleaner main body 100 or the extension tube 200 is inserted into the other axial end of the second connection tube 382.

[0223] Meanwhile, in the present embodiment, the second connection tube 382 may be coupled to the auxiliary battery housing 400. Specifically, the second connection tube 382

may be coupled to the auxiliary battery housing 400 while penetrating the auxiliary battery housing 400. Meanwhile, although not illustrated, a catching projection may be provided on the second connection tube 382, and a connection tube fixing part 423 of the auxiliary battery housing 400 may be coupled to the catching projection.

[0224] Meanwhile, the electric wires may be embedded in the first and second connection tubes 381 and 382, respectively, and the electric wire embedded in the first connection tube 381 and the electric wire embedded in the second connection tube 382 may be electrically connected to each other. With this configuration, the current applied from the battery 190 of the cleaner main body 100 or the auxiliary battery 500 may be transmitted to the cleaning module 300.

[0225] Meanwhile, the guide tube may connect the internal space of the first connection tube 381 and the internal space of the second connection tube 382. The guide tube may have a flow path formed therein so that the air sucked into the cleaning module 300 flows to the extension tube 200 and/or the cleaner main body 100. In this case, the guide tube may be deformed together with the first and second connection tubes 381 and 382 as the first and second connection tubes 381 and 382 rotate. For example, the guide tube may be provided in the form of a corrugated tube (bellows-shaped tube).

[0226] Meanwhile, the second connection tube 382 may have an extension tube separating button 384. On the basis of a state in which the second connection tube 382 stands to be perpendicular to the ground surface, the extension tube separating button 384 may be disposed at a front side of the second connection tube 382. Alternatively, the extension tube separating button 384 may be disposed at an upper side of the second connection tube 382 in a state in which the second connection tube 382 is in parallel with the ground surface or inclined at a predetermined angle with respect to the ground surface.

[0227] The extension tube separating button 384 may be coupled to the extension tube 200 by a hook engagement. When an external force is applied, the extension tube separating button 384 may be decoupled from the extension tube 200. For example, the extension tube separating button 384 may be provided in the form of an elongated board, and a hook may be provided at one end (a front end) of the extension tube separating button 384. In addition, a hinge part is provided on a central portion of the extension tube separating button 384, such that the extension tube separating button 384 may be hingedly coupled to the second connection tube 382. In this case, a torsion spring may be provided on the hinge part and elastically support the coupling between the extension tube separating button 384 and the extension tube 200. Further, a button part may be provided at the other end (a rear end) of the extension tube separating button 384 and guide a position at which the user pushes the extension tube separating button 384. With this configuration, the hook of the extension tube separating button 384 may be coupled to the extension tube 200 by the hook engagement. When the user pushes the button part, the button part rotates about the hinge part, such that the extension tube separating button 384 may be decoupled from the extension tube 200.

[0228] In addition, the second connection tube 382 may have a support protrusion 385. On the basis of the state in which the second connection tube 382 stands to be perpendicular to the ground surface, the support protrusion 385

may be disposed at a rear side of the second connection tube 382. Alternatively, the support protrusion 385 may be disposed at a lower side of the second connection tube 382 in the state in which the second connection tube 382 is in parallel with the ground surface or inclined at a predetermined angle with respect to the ground surface.

[0229] The support protrusion 385 includes a protruding portion and a support portion. The protruding portion may protrude from an outer peripheral surface of the second connection tube 382. The support portion may have a plate shape perpendicular to the protruding portion.

[0230] When the cleaner main body 100 is placed on the ground surface (floor surface), the support portion may come into contact with the ground surface and support the connection tube 380. With this configuration, the connection tube 380 and/or the extension tube 200 may be stably supported when the cleaner 1 is placed on the floor surface, which makes it possible to prevent damage to the connection tube 380 and/or the extension tube 200.

[0231] Meanwhile, in the present embodiment, the support protrusion 385 may be inserted into a guide hole 422 of the auxiliary battery housing 400. With this configuration, it is possible to guide the positions at which the connection tube 380 and the auxiliary battery housing 400 are coupled and to stably fix the auxiliary battery housing 400 to the connection tube 380.

[0232] Meanwhile, the cleaning module 300 may include the printed circuit board 390 on which a module control unit (not illustrated) configured to control the cleaning module 300 is disposed. The current may be applied to the printed circuit board 390, and a communication line may be disposed on the printed circuit board 390. In this case, the printed circuit board 390 may be cooled by air which is introduced into a cooling air inlet port 317 and discharged to a cooling air discharge port 318.

[0233] Meanwhile, the module housing 310 may further include the first operating part 391 configured to adjust the amount of water to be discharged from the water tank 320. For example, the first operating part 391 may be positioned at the rear side of the module housing 310.

[0234] The user may manipulate the first operating part 391. The user may manipulate the first operating part 391 to allow the water tank 320 to discharge water or not to discharge water.

[0235] Alternatively, the first operating part 391 may adjust the amount of water to be discharged from the water tank 320. For example, the user may manipulate the first operating part 391 so that a first amount of water is discharged per unit time from the water tank 320 or a second amount of water, which is larger than the first amount of water, is discharged per unit time.

[0236] The first operating part 391 may be disposed on the module housing 310 and configured to pivot in the leftward/rightward direction. According to the embodiments, the first operating part 391 may pivot in the upward/downward direction.

[0237] For example, the amount of water to be discharged is 0 when the first operating part 391 is positioned at a neutral position. When the first operating part 391 is pushed leftward and the first operating part 391 pivots leftward, the first amount of water may be discharged per unit time from the water tank 320. Further, when the first operating part 391 is pushed rightward and the first operating part 391 pivots

rightward, the second amount of water may be discharged per unit time from the water tank 320.

[0238] Meanwhile, the module housing 310 may further include a second operating part 392 configured to adjust a phase of the moisture discharged from the steam generator 336. For example, the second operating part 392 may be positioned at the rear side of the module housing 310.

[0239] The user may adjust the second operating part 392. The user may adjust the second operating part 392 so that the water or steam (moisture vapor) may be discharged from the steam generator 336 to the mop 350.

[0240] The second operating part 392 may be rotatably provided on the module housing 310. For example, the second operating part 392 may be a rotary handle (dial).

[0241] For example, in a state in which the second operating part 392 rotates and indicates a first position, the steam generator 336 does not heat water and may discharge room-temperature water to the mop 350. In addition, in a state in which the second operating part 392 rotates and indicates a second position different from the first position, the steam generator 336 may heat water and discharge the heated water to the mop 350. In addition, in a state in which the second operating part 392 rotates and indicates a third position different from the first and second positions, the steam generator 336 changes the phase of water into steam (moisture vapor) by heating the water and then discharges the steam to the mop 350.

[0242] The auxiliary battery housing 400 may be detachably coupled to the cleaning module 300, and the auxiliary battery 500 may be detachably coupled to the auxiliary battery housing 400. Specifically, the auxiliary battery housing 400 may be coupled to the connection tube 380 of the cleaning module 300 and accommodate the auxiliary battery 500 so that the auxiliary battery 500 is detachable. The auxiliary battery housing 400 may be disposed between the extension tube 200 and the cleaning module 300 in the state in which the auxiliary battery housing 400 is coupled to the cleaning module 300. The auxiliary battery housing 400 may include an auxiliary battery accommodation part 410, a coupling part 420, and a power connection part (not illustrated).

[0243] The auxiliary battery 500 may be detachably coupled to the auxiliary battery accommodation part 410. The auxiliary battery 500 may be detachably accommodated in the auxiliary battery accommodation part 410.

[0244] Specifically, the auxiliary battery accommodation part 410 may include an accommodation part main body 411, an auxiliary battery accommodation groove 412, a terminal 413, a catching projection 414, and a fastening hole 415.

[0245] In this case, the auxiliary battery accommodation groove 412 may be formed in the accommodation part main body 411, and the terminal 413 may be provided in the accommodation part main body 411. In addition, the catching projection 414 and the fastening hole 415 may be formed at two opposite sides of the accommodation part main body 411.

[0246] The accommodation part main body 411 may define an external appearance of the auxiliary battery housing 400 and accommodate the auxiliary battery 500 therein. For example, the accommodation part main body 411 may have a shape similar to a quadrangular column shape, and four edges of the accommodation part main body 411 may be curved. Further, the accommodation part main body 411

is opened at one axial end thereof so that the auxiliary battery 500 may be accommodated in the accommodation part main body 411. The other axial end of the accommodation part main body 411 may have a width based on the leftward/rightward direction that gradually decreases so that the other axial end of the accommodation part main body 411 is connected to the coupling part 420. With this configuration, the accommodation part main body 411 may accommodate the auxiliary battery 500 while minimizing an overall volume and weight. The auxiliary battery accommodation groove 412 may accommodate the auxiliary battery 500. The auxiliary battery accommodation groove 412 may have a shape corresponding to a shape of the auxiliary battery main body 510 so that the auxiliary battery main body 510 may be inserted into the auxiliary battery accommodation groove 410. For example, a diameter of the auxiliary battery accommodation groove 412 based on the forward/rearward direction may be equal to or larger than a diameter of the battery main body 510 based on the forward/rearward direction. In addition, a diameter of the auxiliary battery accommodation groove 412 based on the leftward/rightward direction may be equal to or larger than a diameter of the battery main body 510 based on the leftward/rightward direction. In addition, a curvature of a sidewall of the auxiliary battery accommodation groove 412 may be equal to a curvature of an outer surface of the battery main body 510.

[0247] Meanwhile, the auxiliary battery accommodation groove 412 may have a sidewall having an inclined surface inclined at predetermined angle in the state in which the auxiliary battery housing 400 is coupled to the connection tube 380. In this case, an inlet of the auxiliary battery accommodation groove 412, into which the auxiliary battery 500 is inserted, may be opened to be inclined upward at a predetermined angle with respect to the ground surface.

[0248] Therefore, the auxiliary battery 500 may be inclined downward and inserted into and coupled to the auxiliary battery housing 400. Specifically, a direction in which the auxiliary battery accommodation groove 412 is formed may have an angle of 0 degrees or more and less than 90 degrees with respect to an axial direction of the extension tube 200. For example, an imaginary extension line, which penetrates the auxiliary battery accommodation groove 412, may be parallel to an imaginary extension line penetrating an inner flow path of the extension tube 200 or intersect the imaginary extension line penetrating the inner flow path of the extension tube 200 at an angle of less than 90 degrees. That is, the direction in which the auxiliary battery 500 is inserted may have an angle of 0 degrees or more and less than 90 degrees with respect to a longitudinal direction of the extension tube 200.

[0249] The terminal 413 may be provided at a lower end of the auxiliary battery accommodation groove 412. That is, the terminal 413 may be provided in the auxiliary battery accommodation groove 412 and disposed at a position farthest from the inlet into which the auxiliary battery 500 is inserted. With this configuration, when the auxiliary battery 500 is coupled to the auxiliary battery accommodation groove 412, a terminal provided on an electric connection part 540 of the auxiliary battery 500 may come into contact with the terminal 413.

[0250] The catching projection 414 may be coupled to the auxiliary battery 500 by a hook engagement. The catching projection 414 may be formed at one side of the accommo-

dation part main body 411 based on the leftward/rightward direction. A first coupling button 520 of the auxiliary battery 500 may be coupled to the catching projection 414. In this case, a first button part 521 may be caught and supported by the catching projection 414, and a first hook 522 may be coupled to the catching projection 414 by a hook engagement.

[0251] The fastening hole 415 may be coupled to the auxiliary battery 500 by a hook engagement. The fastening hole 415 may be formed at the other side of the accommodation part main body 411 based on the leftward/rightward direction. A second coupling button 530 of the auxiliary battery 500 may be coupled to the fastening hole 415. In this case, a second hook 532 may be coupled to the fastening hole 415 by a hook engagement.

[0252] Therefore, when the auxiliary battery 500 is inserted into the auxiliary battery accommodation groove 411, the catching projection 414 and the fastening hole 415 may be coupled to the auxiliary battery 500 by the hook engagement, thereby preventing the separation of the auxiliary battery 500.

[0253] The coupling part 420 may be coupled to the cleaning module 300.

[0254] Specifically, the coupling part 420 includes a coupling part main body 421, a guide hole 422, and a connection tube fixing hook 423.

[0255] The connection tube 380 of the cleaning module 300 may be coupled to the coupling part main body 421 while penetrating the coupling part main body 421. For example, the coupling part main body 421 may have a tubular shape. A through-hole 421a may be formed in the coupling part main body 421 so that the connection tube 380 is coupled to the coupling part main body 421 while penetrating the through-hole 421a. In this case, an inner diameter of the coupling part main body 421 may be equal to an outer diameter of the second connection tube 382 or larger than the outer diameter of the second connection tube 382. With this configuration, the second connection tube 382 may be penetratively accommodated in the coupling part main body 421.

[0256] The guide hole 422 may be formed in the coupling part main body 421 and provided in the form of a long hole in the axial direction of the coupling part main body 421. The guide hole 422 may accommodate the support protrusion 385 of the connection tube 380. Therefore, when the second connection tube 382 is coupled to the coupling part 420, the support protrusion 385 may move along the guide hole 422, and the support protrusion 385 penetrates the guide hole 422 and be exposed to the outside. With this configuration, the guide hole 422 may guide the coupling between the connection tube 380 and the coupling part 420.

[0257] The connection tube fixing part 423 may be provided on the coupling part main body 421 and coupled to the connection tube 380 by a hook engagement. When an external force is applied, the connection tube fixing part 423 may be decoupled from the connection tube 380. For example, the connection tube fixing part 423 may be provided in the form of an elongated board, and a hook may be provided at one end of the connection tube fixing part 423. In addition, a hinge part may be provided on a central portion of the connection tube fixing part 423, such that the connection tube fixing part 423 may be hingedly coupled to the coupling part main body 421. In this case, a torsion spring may be provided on the hinge part and elastically

support the coupling between the connection tube fixing part 423 and the connection tube 380. Further, a button part may be provided at the other end of the connection tube fixing part 423 and guide a position at which the user pushes the button part. With this configuration, a hook of the connection tube fixing part 423 may be coupled to the second connection tube 382 by a hook engagement. When the user pushes the button part, the connection tube fixing part 423 may be rotated about the hinge part and decoupled from the second connection tube 382.

[0258] The connection tube fixing part 423 may be coupled to the coupling part main body 421. Specifically, the connection tube fixing part 423 may be hingedly coupled to a lateral side of the coupling part main body 421. For example, the hinge part of the connection tube fixing part 423 may be coupled to an outer peripheral surface of the coupling part main body 421, and a hook passing hole may be formed in the coupling part main body 421 so that a hook of the coupling part main body 421 may pass through the hook passing hole. With this configuration, when the second connection tube 382 is inserted into and coupled to the coupling part main body 421, the hook of the connection tube fixing part 423 may be fastened to the second connection tube 382 and fix the coupling between the coupling part 420 and the connection tube 380.

[0259] Meanwhile, in the present embodiment, the auxiliary battery accommodation part 410 may be disposed to be farther from the floor surface than is the coupling part 420.

[0260] That is, when the cleaner main body 100 is placed on the floor surface in the state in which the auxiliary battery 500 is coupled to the auxiliary battery housing 400 and the auxiliary battery housing 400 is coupled to the cleaning module 300, at least a part of the extension tube 200 may be disposed to be closer to the floor surface than is the auxiliary battery 500.

[0261] In addition, when the cleaning module 300 is placed on the floor surface in the state in which the auxiliary battery 500 is coupled to the auxiliary battery housing 400 and the auxiliary battery housing 400 is coupled to the cleaning module 300, at least a part of the auxiliary battery 500 may be disposed to be farther from the floor surface than is the connection tube 380. For example, an upper end of the auxiliary battery 500 may be disposed to be farther from the floor surface than is an upper end of the connection tube 380.

[0262] Further, the auxiliary battery 500 may be disposed to be farther from the floor than is a portion where the extension tube 200 and the cleaning module 300 are in contact with each other in the state in which the extension tube 200 and the cleaning module 300 are coupled.

[0263] With this configuration, when the user stands the extension tube 200 almost perpendicularly to the cleaning module 300, a self-standing effect in which the extension tube 200 and the cleaner main body 100 are kept standing perpendicularly to the ground surface is enabled.

[0264] Meanwhile, the power connection part (not illustrated) may electrically connect the auxiliary battery 500 and the cleaning module 300. For example, the power connection part (not illustrated) may include two or more electric wires and connect an electric wire provided in the cleaning module 300 to the terminal 412 provided in the auxiliary battery accommodation part 410. With this configuration, the auxiliary battery 500 may supply power to the cleaning module 300.

[0265] In addition, the power connection part (not illustrated) may electrically connect the auxiliary battery 500 and the battery 190. In this case, the power connection part (not illustrated) may be configured as a separate circuit provided in the auxiliary battery housing 400. Of course, the power connection part (not illustrated) may be provided on the printed circuit board 390.

[0266] For example, the power connection part (not illustrated) may connect the auxiliary battery 500 and the battery 190 in series. With this configuration, the auxiliary battery 500 may be connected in series to the battery 190 and supply power to the cleaning module 300.

[0267] Therefore, when high-voltage power is required, the cleaner 1 according to the present disclosure may connect the auxiliary battery 500 and the battery 190 in series and supply the high-voltage power to the cleaning module 300.

[0268] As another example, the power connection part (not illustrated) may connect the auxiliary battery 500 and the battery 190 in parallel. With this configuration, the auxiliary battery 500 may be connected in parallel to the battery 190 and supply power to the cleaning module 300.

[0269] Therefore, when high-capacity power is required, the cleaner 1 according to the present disclosure may connect the auxiliary battery 500 and the battery 190 in parallel and supply the high-capacity power to the cleaning module 300.

[0270] Meanwhile, in the present disclosure, the power connection part (not illustrated) may switch the connection between the series connection between the auxiliary battery 500 and the battery 190 and the parallel connection between the auxiliary battery 500 and the battery 190. Specifically, the power connection part (not illustrated) may change electrical connection between the auxiliary battery 500, the battery 190, and the cleaning module 300.

[0271] For example, the power connection part (not illustrated) may electrically connect the auxiliary battery 500 and the battery 190 and electrically connect the auxiliary battery 500 and the cleaning module 300, thereby connecting the auxiliary battery 500 and the battery 190 in series. In addition, the power connection part (not illustrated) may electrically connect the battery 190 and the cleaning module 300 and electrically connect the auxiliary battery 500 and the cleaning module 300, thereby connecting the auxiliary battery 500 and the battery 190 in parallel. Further, the power connection part (not illustrated) may change the electrical connection between the battery 190 and the cleaning module 300 to the electrical connection between the battery 190 and the auxiliary battery 500 by using a switch or the like.

[0272] Meanwhile, according to the embodiments, the power connection part (not illustrated) may connect the auxiliary battery 500 and the steam generator 336. In this case, the battery 190 may supply power to the components of the cleaner 1 including the suction motor 140 but excluding the steam generator 336, and the auxiliary battery 500 may supply power only to the steam generator 336. With this configuration, the auxiliary battery 500 may supply power directly to the steam generator 336.

[0273] Therefore, the auxiliary battery 500 may stably supply power, within a short time, to the steam generator 336 that requires a relatively large amount of power.

[0274] The auxiliary battery 500 may supply power to the cleaner main body 100 or the cleaning module 300. The

auxiliary battery 500 may include the auxiliary battery main body 510, the first coupling button 520, the second coupling button 530, and the electric connection part 540.

[0275] The auxiliary battery main body 510 may supply power to the cleaner main body 100 or the cleaning module 300. The auxiliary battery main body 510 may define an external shape of the auxiliary battery 500 and store electrical energy therein. For example, the auxiliary battery main body 510 may be a secondary battery.

[0276] The first coupling button 520 may be disposed at one side of the auxiliary battery main body 510. The first coupling button 520 may be coupled to the catching projection 414 of the auxiliary battery housing 400 by a hook engagement. For example, the first coupling button 520 may include the first button part 521 and the first hook 522. One end of the first button part 521 may be connected to one side of the auxiliary battery main body 510. In this case, the first button part 521 may be made of a material having elasticity. Further, the first hook 522 may be connected to the other end of the first button part 521 and protrude in a direction away from the auxiliary battery main body 510. The first hook 522 may be coupled to the catching projection 414 by the hook engagement.

[0277] With this configuration, when the auxiliary battery 500 is coupled to the auxiliary battery housing 400, the first hook 522 may be coupled to the catching projection 414 by the hook engagement. Further, the user may separate the auxiliary battery 500 from the auxiliary battery housing 400 by pulling the auxiliary battery 500 while pushing the first button part 521.

[0278] The second coupling button 530 may be disposed at the other side of the auxiliary battery main body 510. The second coupling button 530 may be coupled to the fastening hole 415 of the auxiliary battery housing 400 by the hook engagement. For example, the second coupling button 530 may include a second button part 531 and the second hook 532. One end of the second button part 531 may be connected to the other side of the auxiliary battery main body 510. In this case, the second button part 531 may be made of a material having elasticity. Further, the second hook 532 may be connected to the other end of the second button part 531 and protrude in a direction away from the auxiliary battery main body 510. The second hook 532 may be coupled to the fastening hole 415 by the hook engagement.

[0279] With this configuration, when the auxiliary battery 500 is coupled to the auxiliary battery housing 400, the second hook 532 may be coupled to the fastening hole 415 by the hook engagement. Further, the user may separate the auxiliary battery 500 from the auxiliary battery housing 400 by pulling the auxiliary battery 500 while pushing the second button part 531.

[0280] The electric connection part 540 may be provided at a lower side of the auxiliary battery main body 510. When the auxiliary battery 500 is coupled to the auxiliary battery housing 400, the electric connection part 540 may be electrically connected to the terminal 413 of the auxiliary battery housing 400. With this configuration, when the auxiliary battery 500 is coupled to the auxiliary battery housing 400, power stored in the auxiliary battery 500 may be supplied to the cleaner main body 100 or the cleaning module 300.

[0281] Meanwhile, FIGS. 13 and 14 are views for explaining states in which a cleaning module 300 and an auxiliary battery housing 400 of a cleaner according to a second embodiment of the present disclosure are coupled.

[0282] A cleaning module and an auxiliary battery housing of a cleaner according to a second embodiment of the present disclosure will be described below with reference to FIGS. 13 and 14.

[0283] In order to avoid the repeated description, the description of the configuration and effect of the cleaner according to the embodiment of the present disclosure may be applied except for components particularly described in the present embodiment.

[0284] In the present embodiment, a guide hole 1422 may be formed in a coupling part main body 1421 and provided in the form of a long hole in an axial direction of the coupling part main body 1421. An extension tube separating button 1384 of a connection tube 1380 may be accommodated in the guide hole 1422. Therefore, the connection tube 1380 is coupled to a coupling part 1420, the extension tube separating button 1384 may move along the guide hole 1422, and the extension tube separating button 1384 may penetrate the guide hole 1422 and be exposed to the outside. With this configuration, the guide hole 1422 may guide the coupling between the connection tube 1380 and the coupling part 1420.

[0285] Meanwhile, in the present embodiment, the coupling part 1420 may further include a support rib 1424. At least one support rib 1424 may protrude from the coupling part main body 1421. Further, the support rib 1424 may be connected to an accommodation part main body 1411. That is, the support rib 1424 may connect the coupling part main body 1421 and the accommodation part main body 1411.

[0286] With this configuration, the support rib 1424 may support the connection between the coupling part main body 1421 and the accommodation part main body 1411.

[0287] When an auxiliary battery housing 1400 is placed on the ground surface in the state in which the auxiliary battery housing 1400 is coupled to the cleaning module 300, the support rib 1424 may support the connection between the coupling part main body 1421 and the accommodation part main body 1411, thereby preventing damage to the auxiliary battery housing 1400.

[0288] Meanwhile, in the present embodiment, the auxiliary battery accommodation part 1410 may be disposed to be closer to the floor surface than is the coupling part 1420.

[0289] That is, when a cleaning module 1300 and a cleaner main body 1100 are placed on the floor surface in the state in which an auxiliary battery 1500 is coupled to the auxiliary battery housing 1400 and the auxiliary battery housing 1400 is coupled to the cleaning module 1300, at least a part of the auxiliary battery 1500 may be disposed to be closer to the floor surface than is an extension tube 1200.

[0290] In addition, when the cleaning module 1300 is placed on the floor surface, at least a part of the auxiliary battery 1500 may be disposed to be closer to the floor surface than is the connection tube 380. For example, a lower end of the auxiliary battery 1500 may be disposed to be closer to the floor surface than is a lower end of the connection tube 380.

[0291] Further, in the state in which the extension tube 1200 and the cleaning module 1300 are coupled, the auxiliary battery 1500 may be disposed to be closer to the floor than is a portion where the extension tube 1200 and the cleaning module 1300 are in contact with each other.

[0292] With this configuration, a volume of the cleaning module 1300 based on the upward/downward direction is reduced in the state in which the auxiliary battery 1500 is

mounted. Therefore, it is possible to advantageously clean a space, such as a space below a sofa, which limits a height of the cleaning module **1300** that may enter the space.

[0293] In addition, an overall center of gravity of the cleaning module **1300** is lowered, which makes it possible for the user to easily manipulate operations such as a change in direction.

[0294] FIG. 17 is a view for explaining a state in which an auxiliary battery housing is coupled to an extension tube of a cleaner according to a third embodiment of the present disclosure.

[0295] Meanwhile, an auxiliary battery housing of a cleaner according to a third embodiment of the present disclosure will be described below with reference to FIG. 17.

[0296] In order to avoid the repeated description, the description of the configuration and effect of the cleaner according to the embodiment of the present disclosure may be applied except for components particularly described in the present embodiment.

[0297] In the present embodiment, an auxiliary battery housing **2400** may be coupled to an extension tube **2200**. That is, a coupling part **2420** of the auxiliary battery housing **2400** may be coupled to the extension tube **2200**.

[0298] Specifically, the coupling part **2420** includes a coupling part main body **2421** and a connection tube fixing hook **2423**.

[0299] The extension tube **2200** may be penetratively coupled to the coupling part main body **2421**. For example, the coupling part main body **2421** may have a tubular shape. A through-hole **2421a** may be formed in the coupling part main body **2421** so that the extension tube **2200** is coupled to the coupling part main body **2421** while penetrating the through-hole **2421a**. In this case, an inner diameter of the coupling part main body **2421** may be equal to an outer diameter of the extension tube **2200** or larger than the outer diameter of the extension tube **2200**. With this configuration, the extension tube **2200** may be penetratively accommodated in the coupling part main body **2421**.

[0300] FIG. 18 is a view for explaining a state in which an auxiliary battery housing is coupled to a cleaner main body of a cleaner according to a fourth embodiment of the present disclosure.

[0301] Meanwhile, a cleaner main body and an auxiliary battery housing of a cleaner according to a fourth embodiment of the present disclosure will be described below with reference to FIG. 18.

[0302] In order to avoid the repeated description, the description of the configuration and effect of the cleaner according to the embodiment of the present disclosure may be applied except for components particularly described in the present embodiment.

[0303] In the present embodiment, an auxiliary battery housing **3400** may be detachably coupled to a battery housing **3180** of a cleaner main body **3100**. For example, the auxiliary battery housing **3400** may be detachably coupled to a lower surface of the battery housing **3180**.

[0304] The auxiliary battery housing **3400** may be disposed at a lower side of a battery **3190** in a state in which the battery **3190** is coupled to the battery housing **3180**.

[0305] FIG. 19 is a view for explaining a state in which an auxiliary battery housing is coupled to a cleaner main body of a cleaner according to a fifth embodiment of the present disclosure.

[0306] Meanwhile, a cleaner main body and an auxiliary battery housing of a cleaner according to a fifth embodiment of the present disclosure will be described below with reference to FIG. 19.

[0307] In order to avoid the repeated description, the description of the configuration and effect of the cleaner according to the embodiment of the present disclosure may be applied except for components particularly described in the present embodiment.

[0308] In the present embodiment, an auxiliary battery housing **4400** may be detachably coupled to a battery housing **4180** of a cleaner main body **4100**. For example, the auxiliary battery housing **4400** may be detachably coupled to one side of the battery housing **4180**.

[0309] While the present disclosure has been described with reference to the specific embodiments, the specific embodiments are only for specifically explaining the present disclosure, and the present disclosure is not limited to the specific embodiments. It is apparent that the present disclosure may be modified or altered by those skilled in the art without departing from the technical spirit of the present disclosure.

[0310] All the simple modifications or alterations to the present disclosure fall within the scope of the present disclosure, and the specific protection scope of the present disclosure will be defined by the appended claims.

DESCRIPTION OF REFERENCE NUMERALS

- | | |
|--------|---|
| [0311] | 1: Cleaner |
| [0312] | 100: Cleaner main body |
| [0313] | 200: Extension tube |
| [0314] | 300: Cleaning module |
| [0315] | 310: Module housing |
| [0316] | 311: Lower housing |
| [0317] | 312: Upper housing |
| [0318] | 312a: Rear surface |
| [0319] | 313: Flow path forming part |
| [0320] | 320: Water tank |
| [0321] | 330: Moisture supply unit |
| [0322] | 336: Steam generator |
| [0323] | 337: Diffuser |
| [0324] | 340: Rotary cleaning unit |
| [0325] | 350: Mop |
| [0326] | 370: Mop driving motor |
| [0327] | 380: Connection tube |
| [0328] | 381: First connection tube |
| [0329] | 400: Auxiliary battery housing |
| [0330] | 410: Auxiliary battery accommodation part |
| [0331] | 420: Coupling part |
| [0332] | 430: Power connection part |
| [0333] | 500: Auxiliary battery |
1. A cleaner comprising:
 - a cleaner main body comprising a battery and a handle configured to be grasped by a user;
 - a cleaning module detachably coupled to the cleaner main body and configured to eliminate debris on a floor surface;
 - an auxiliary battery housing detachably coupled to the cleaning module; and
 - an auxiliary battery detachably coupled to the auxiliary battery housing and configured to supply power to the cleaner main body or the cleaning module.

2. The cleaner of claim 1, further comprising:
an extension tube configured to connect the cleaning module and the cleaner main body,
wherein the auxiliary battery housing is disposed between the extension tube and the cleaning module.
3. The cleaner of claim 2, wherein in a state in which the auxiliary battery is coupled to the auxiliary battery housing and the extension tube and the cleaning module are coupled, the auxiliary battery is disposed to be farther from the floor than is a portion where the extension tube and the cleaning module are in contact with each other.
4. The cleaner of claim 2, wherein when the cleaning module cleans the floor surface in a state in which the auxiliary battery is coupled to the auxiliary battery housing and the extension tube and the cleaning module are coupled, at least a part of the auxiliary battery is disposed to be closer to the floor surface than is the extension tube.
5. The cleaner of claim 2, wherein the auxiliary battery is inclined downward and inserted into and coupled to the auxiliary battery housing.
6. The cleaner of claim 5, wherein a direction in which the auxiliary battery is inserted has an angle of 0 degrees or more and less than 90 degrees with respect to a longitudinal direction of the extension tube.
7. The cleaner of claim 2, wherein the cleaning module comprises a connection tube to which the extension tube and the auxiliary battery housing are coupled, and
wherein an upper end of the auxiliary battery is disposed to be farther from the floor surface than is an upper end of the connection tube in a state in which the auxiliary battery is coupled to the auxiliary battery housing and the auxiliary battery housing is coupled to the connection tube.
8. The cleaner of claim 2, wherein the cleaning module comprises a connection tube to which the extension tube and the auxiliary battery housing are coupled, and
wherein a lower end of the auxiliary battery is disposed to be closer to the floor surface than is a lower end of the connection tube in a state in which the auxiliary battery is coupled to the auxiliary battery housing and the auxiliary battery housing is coupled to the connection tube.
9. The cleaner of claim 1, wherein the auxiliary battery is connected in series to the battery.
10. The cleaner of claim 1, wherein the auxiliary battery is connected in parallel to the battery.
11. The cleaner of claim 1, wherein the auxiliary battery is connected selectively in series or in parallel to the battery.
12. The cleaner of claim 1, wherein the cleaning module comprises:
at least one mop configured to wipe the floor surface; and
a mop driving motor configured to provide a rotational force to the mop.
13. The cleaner of claim 12, wherein the cleaning module comprises:
a water tank configured to store water; and
a diffuser configured to discharge moisture, which is supplied from the water tank, to the mop.
14. The cleaner of claim 13, wherein the cleaning module further comprises a steam generator configured to heat water introduced from the water tank and supply the heated water to the diffuser.
15. The cleaner of claim 14, wherein the auxiliary battery supplies power to the steam generator.
16. A cleaner comprising:
a cleaning module configured to eliminate debris on a floor surface;
a cleaner main body comprising a battery configured to supply power to the cleaning module, and a handle configured to be grasped by a user;
an auxiliary battery configured to supply power to the cleaner main body or the cleaning module; and
an auxiliary battery housing to which the auxiliary battery is detachably coupled,
wherein the cleaner main body comprises a battery housing configured to accommodate the battery, and
wherein the auxiliary battery housing is detachably coupled to the battery housing.
17. A cleaner comprising:
a cleaning module configured to eliminate debris on a floor surface;
a cleaner main body comprising a battery configured to supply power to the cleaning module, and a handle configured to be grasped by a user;
an auxiliary battery configured to supply power to the cleaner main body or the cleaning module;
an extension tube configured to connect the cleaning module and the cleaner main body; and
an auxiliary battery housing detachably coupled to the extension tube and configured such that the auxiliary battery is detachably coupled to the auxiliary battery housing.

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